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ABSTRACT

When historic (1940-70) and recent (1970-74) trends in population, income, and employment for the Northern Great Plains coal region are compared with that for the entire U.S. and all U.S. nonmetro counties, data reveal a minimal population increase from 1940 to 1970, a period of declining agricultural employment and high outmigration rates. In 1970-74, migration and population trends were reversed and total employment increased; large population increases came mostly through immigration to specific coal-producing areas. Enormous socioeconomic factors will be expected to have an impact on the American Indian population, which has 9 percent of the region's total strippable coal reserves. The narrative portion of the profile looks at population and demographic patterns (towns, recent mobility, minority composition, fertility, age structure, dependence rates, educational attainment, school enrollment); employment, earnings, and labor force (employment patterns in public utilities, agriculture, manufacturing, contract construction, mining, transportation, communication, government services; earnings by sex/occupation; past labor force growth/future potential); indicators of well-being (income, poverty, family structure, housing); and implications (baseline economy, community services, regional growth). An appendix of statistical tables comprises almost half the report. (RS)

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A SOCIOECONOMIC PROFILE OF THE NORTHERN GREAT PLAINS COAL REGION

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Fred K. Hines
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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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ABSTRACT

Population in the Northern Great Plains coal region increased 4 percent, by 16,000, between 1940 and 1970. This period of minimal population change was characterized by declining agricultural employment and high rates of outmigration. However, due to a surge in energy development between 1970 and 1974, migration and population trends were reversed, and total employment has increased, especially in the mining and contract construction sectors. Gains in employment induced large population increases, mostly through inmigration to specific coal-producing areas. About 9 percent of the total strippable coal reserves of the region are owned by American Indians, suggesting a large economic role for them in the region's overall energy development.

Key Words: Northern Great Plains, energy, coal, coal development, American Indians.

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SUMMARY

The early 1970's marked a turnaround in population growth for the coal-producing areas of the Northern Great Plains--eastern Montana, western North Dakota, much of Wyoming, and northwestern South Dakota. A reversal of long-standing outmigration to net inmigration was largely due to increased coal production and associated construction activities. During 1970-74, the region's population grew by 4.9 percent, with net inmigration totaling 1.2 percent, or 5,080 people. This growth rate exceeded that of the United States as a whole. It also exceeded the total growth of the region over the previous 30 years.

Much of the recent increase in population resulted from new jobs associated with energy development. Net outmigration of the past, on the other hand, was caused by declining employment in agriculture.

About half of the region's employment was in the agricultural sector in 1940. By 1970, agriculture employed only 30,819 people, or 20 percent of total employment. Although total employment increased from 128,773 to 154,088 over the 30 years, the increase in nonagricultural jobs was not enough to absorb people leaving agriculture and others entering the labor force.

During 1970-74, employment in the region grew at 21.1 percent--about two and a half times faster than overall U.S. employment growth. This sudden surge in employment resulted from increased mining activity and related contract construction. Employment in mining grew by an unprecedented 50.5 percent, while construction employment rose 109.5 percent. The service and finance sectors both experienced sizable growth rates.

Within the region, population growth has been erratic because of the erratic pattern of employment in mining and in contract construction. Many parts of the region have grown in one decade, only to decline in the following decade when mining or construction employment declined. Erratic construction employment has also been due to the building of dams and irrigation projects.

The declining importance of agriculture within the region has had negative effects on growth and viability of many towns. The smaller towns, most of which represent agricultural service centers, generally declined in population over the 1940-70 period, while large towns exhibited growth.

The declines in smaller agricultural trade centers mirror their inability to compete with larger centers for new farm-related business enterprises. In many cases, businesses in smaller trade centers have not been replaced after death or retirement of their owners.

The construction of Garrison Dam, starting in the late 1940's and extending into the 1960's, represents an example of rapid "boom" and "bust" of towns impacted by federally financed construction projects. At the height of construction activities, new "dam" towns such as Coleharbor and Pick City, North Dakota, had substantial populations, but by 1970 these towns had declined drastically.

The sporadic nature of population and employment changes, both over space and across time, has continued into the 1970's, with some areas showing substantial declines. During 1970-74, population growth rates ranged from an

increase of over 30 percent in the southwestern Wyoming area to a loss of 8.3 percent in the northeastern Montana area. In 1970, employment in agriculture in the Wyoming area comprised only 7.8 percent of total employment, whereas in the Montana area, agricultural employment still comprised 30.3 percent of all employment.

So far in the 1970's, mineral development has brought rapid population and employment increases to many towns in the region. For example, mining and construction activities in Sweetwater County, Wyoming, have spurred a population growth in Rock Springs, Wyoming, of over 50 percent.

In 1970, the population of the Northern Great Plains was predominately white, and, compared with the U.S. average, had higher fertility rates, was relatively younger, and, in general, had similar educational attainment levels and school enrollment rates, except for preschool and post-high school levels. Of the minorities, about 90 percent were American Indian. Blacks comprised less than 1 percent of the total population.

Median family income in the region in 1969 was almost 19 percent below the U.S. figure, but slightly above that of all U.S. nonmetro counties. The incidence of poverty was 15.6 percent, in contrast to 13.7 percent for the United States and 20.2 percent for all nonmetro counties. Median earnings for males in the region were slightly higher than the figure for all nonmetro areas, while those for females were lower. About 10.6 percent of the housing in the region was substandard in 1970, compared to a 13.4-percent rate for all nonmetro counties.

The American Indian population totaled 14,604 and was concentrated on reservations, including Crow, Northern Cheyenne, Fort Peck, Fort Berthold. Standing Rock, and Cheyenne River. Concentrations of American Indians within the region coincide with high fertility rates and lower levels of well-being, such as poorer housing, lower income and earnings, higher incidences of poverty, and lower educational attainment.

Strippable coal reserves owned by the Indian tribes in the region are estimated to be almost 7 billion tons, or about 9 percent of the total. These reserves are distributed very unevenly among the tribes, with 90 percent belonging to the Crow and the Northern Cheyenne--73 percent to the Crow alone. The value of the Crow and Northern Cheyenne coal and hence the unevenness of the distribution is heightened because the reserves of these tribes average out as Clean Air Act compliance coal, which is very low in sulfur content.

The potential revenues to the tribes from these strippable reserves, especially from the compliance coal, are enormous. The amount of wealth at stake for the Crow and Northern Cheyenne and the intensity of controversy surrounding potential development are exemplified by legal action taken by the Crow, who are attempting to renegotiate leases made with coal companies during 1968-70. These leases are for tracts on which mining is not yet taking place.

But even if development on these leases were permanently blocked, revenues are now flowing to the Crow from the active Sarpy Creek mine on the Crow-ceded strip, the only Indian deposit in the region now being mined. These revenues,

plus the potential for more--to the Northern Cheyenne as well--would open both vast opportunities and many new problems of adjustment for the tribes affected. Sharp economic differences would probably open between the two "coal" tribes and the others, if no coal development took place on other reservations in the region. Characteristics of the coal on the other reservations are not as favorable for early development as those of the Crow and Northern Cheyenne.

A Socioeconomic Profile of the Northern Great Plains Coal Region

by

Paul R. Myers, Fred K. Hines, and Jeff V. Conopask*

INTRODUCTION

The coal-bearing regions of the Northern Great Plains have come under close scrutiny as an energy supply of considerable magnitude. The Fort Union coal formation, partly within the Northern Great Plains, spans eastern Montana, western North Dakota, much of Wyoming, and northwestern South Dakota. Although only a small percentage of the 600 billion tons of coal deposits, as depicted in figure 1, are economically feasible to mine under current technology, the minable coal reserves (83 billion tons) are still over 138 times the total national output in 1974 (8). 1/

Coal production in the Northern Great Plains began to increase during the late 1960's. In 1966, coal production in the Northern Great Plains was 7.6 million tons. By 1970, production had more than doubled that of 1966, and in 1975, it was almost 7 times the 1966 level (app. table 1). Further increases can be expected by 1980. According to one source, based on projects already on the drawing board, the 1980 production may top 200 million tons, which compares with 55.3 million tons in 1975 (6).

Since these coal developments have occurred and will continue to occur mostly in sparsely settled areas, major changes in the community and economic structure can be expected. Growth of old and new communities will occur. Major questions about supply and demand of public services will need to be addressed.

Purpose of Study

This study provides a socioeconomic profile of selected coal areas of the Northern Great Plains. Potential problems that may arise from coal development are identified and measured. The report covers such items as historical and recent trends in population, income, and employment for the region as a whole, and for selected areas and towns within the region. Data for the region are

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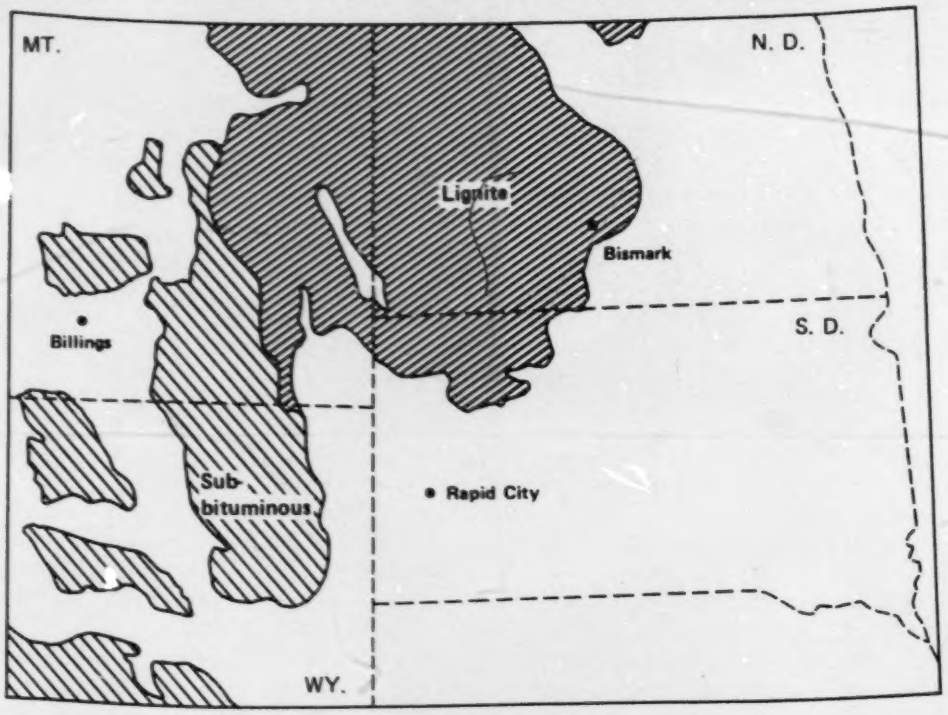
1/ Underscored numbers in parentheses refer to references listed at the end of this report.

Figure 1
Fort Union Coal Formation of the Northern Great Plains Coal Region



compared with data for the entire United States and all U.S. nonmetro counties. 2/ The report makes wide use of data from the Census of Population. The Federal State Cooperative series of county population estimates are used to measure 1970-74 population change and components of change (1).

Area of Study

For this report, 47 counties of the Northern Great Plains were grouped into 13 areas (app. table 2), based on characteristics of their coal reserves. For a county to be included in the study, it had to have 10 million tons of strippable coal reserves. Therefore, some counties that produce coal but do not have the required coal reserves were not included. In contrast, some counties that are not presently producing coal but have the required potential are included.

2/ A Standard Metropolitan Statistical Area (SMSA) is a county or a group of contiguous counties which contain at least one city of 50,000 inhabitants or more, or twin cities with a combined population of at least 50,000. In addition, contiguous counties are included in an SMSA if according to certain criteria they are socially and economically integrated with the central city. A nonmetro county then is a subtraction of metro counties from the total counties in the United States, and the remaining counties are nonmetro.

The counties were grouped into 13 areas that were more or less homogenous in such coal characteristics as sulfur and British thermal unit (Btu) content. Another consideration for grouping counties was availability of water. The location of coal mines in relation to major cities is depicted in figure 2.

The 37 mines operated in 1974 produced 42.3 million tons of coal, most of which was concentrated in Montana-4, North Dakota-2, and North Dakota-3, and the four areas of Wyoming (app. table 5). In 1974, 3 of the 13 areas had no coal production (Montana-1, Montana-3, and South Dakota-1) while only very small quantities were mined in Montana-2 and Montana-5. 3/

POPULATION AND DEMOGRAPHIC PATTERNS

Population Growth, 1940-70

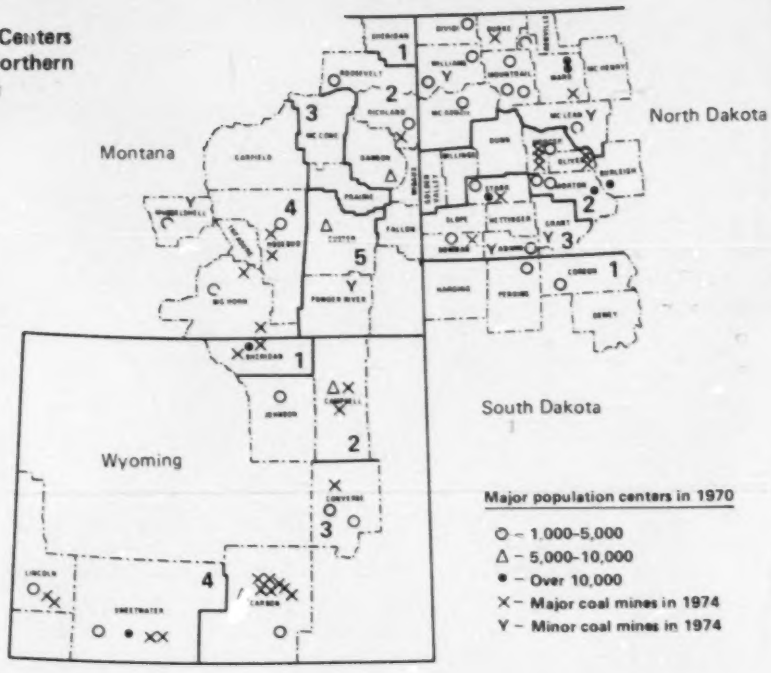
Population growth rates in the region have not paralleled the large population growth rate of the United States since 1940. Like most nonmetro areas of the United States, the region has been characterized by net outmigration, primarily because of a heavy reliance on agriculture as a major economic base during a period when agricultural employment was declining because of rapid mechanization. In 1940, the population of the 47-county coal region totaled 407,198. By 1970, it had grown to 423,303, or by only 4.0 percent, while the United States as a whole grew by 53.8 percent (app. table 3). 4/ During the 1940's and 1950's, the Northern Great Plains experienced slight population growth, although outmigration rates in the 1950's suggest that the region did not provide enough employment to hold more than a small portion of its natural increase (app. table 3). The region declined in population during the 1960's, largely because of an accelerated decline in agricultural employment, as well as a reduced natural increase (fig. 3).

There have been large differences in population growth patterns among areas of the Northern Great Plains. Within the region, population growth has been erratic, resulting from erratic employment patterns in mining and in contract construction. For the region as a whole, population remained fairly stable during 1940-70, with the natural population increase exceeding growth in employment, resulting in persistent net outmigration. During the period, 7 of the 13 areas lost population despite very high natural increases. Most of the growth in population for the entire region occurred in ND-1, the largest of the areas, where population increased by almost one-fifth. The growth in ND-1 was attributable to increased employment in mining, manufacturing, and construction, as well as substantial increases in military personnel (Minot Air Force Base), which in turn induced employment in the nonbasic industries.

3/ These 13 coal areas of the Northern Great Plains are the same as the coal-producing areas (CPA's) for the larger study: "Northern Great Plains Resources and Coal Development," NRED working paper, Number 29, Economic Research Service, USDA, Washington, D.C., Apr. 1977.

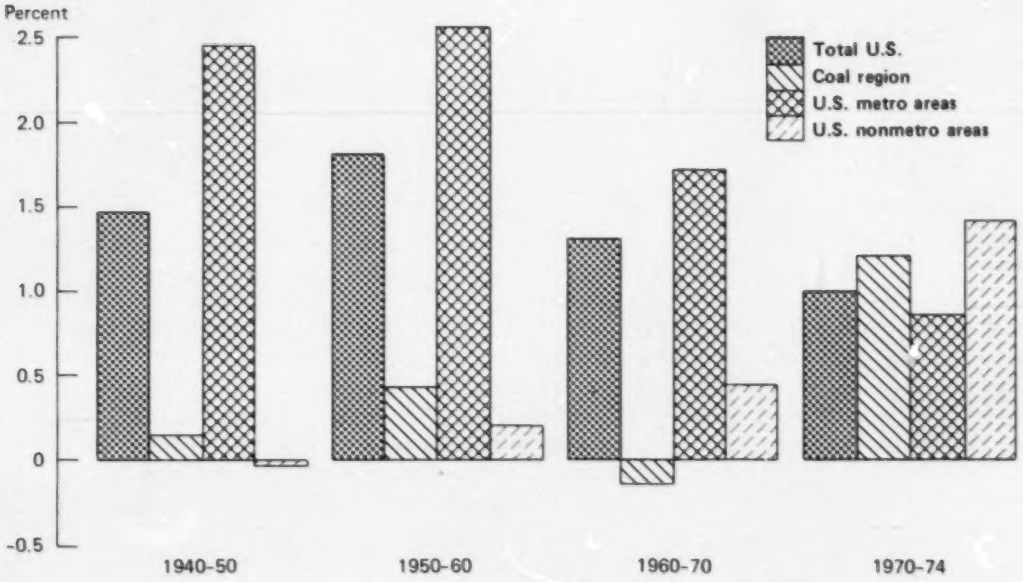
4/ This includes the military personnel stationed at Minot Air Force Base, N.D.

Figure 2
Location of Population Centers and Coal Mines in the Northern Great Plains Coal Regio



Source: Appendix table 5.

Figure 3
Average Annual Population Growth Rates



Source: (2).

Among the areas, population growth rates during the 1950's ranged from a loss of 13.2 percent in WY-4 (which had a net outmigration rate of 29.9 percent) to a population gain of 18.8 percent in WY-2. Ironically, both the large losses in WY-4 and the large gains in WY-2 appear to have resulted from substantial fluctuations in mining employment.

The erratic pattern in population growth among areas continued in the 1960's, with the mining-based population increases in the Gillette area continuing, but the losses in WY-4 ceasing largely because of stable mining employment. Populations of Tioga and Ray (ND-1) are examples of the "boom and bust" behavior of natural resource development. The population in these areas rose markedly during the oil boom of the 1950's, but declined greatly during the 1960's, when the wild frenzy of speculation and wildcatting subsided.

In recent years, Forsyth (MT-4) has experienced a sudden population increase as a result of coal mining development and construction of thermogeneration plants at Colstrip, 35 miles away. In Wyoming, some places have gone through one mineral boom after another since 1940--petroleum, uranium, coal, trona, soda-ash preparation plants, and construction of thermogenerators. The construction of Garrison Dam by the Corps of Army Engineers from 1947 to well into the 1960's, had a major impact on the population of places in ND-1 and ND-2. Other federally financed construction projects that had great impacts on employment and population in the Northern Great Plains are the Minot Air Base and the Minot Minuteman Missile Complex in ND-1, Dickinson Dam and Bowman-Holey Dam in ND-3, Heart Butte Dam in ND-2, Shadehill Dam in SD-1, Yellowtail Dam in MT-4, and Garrison Diversion Project now under construction in ND-1.

These kinds of employment activities have contributed to the irregular pattern of past population growth and decline in the region. Many areas of the region have grown in one decade, only to decline in the following decade when mining and/or construction employment declined. For example, of the eight areas of the region where mining employment declined in the 1940's, seven of these areas had increased mining employment in the 1950's. And of these seven, five areas again had decreased mining employment in the 1960's.

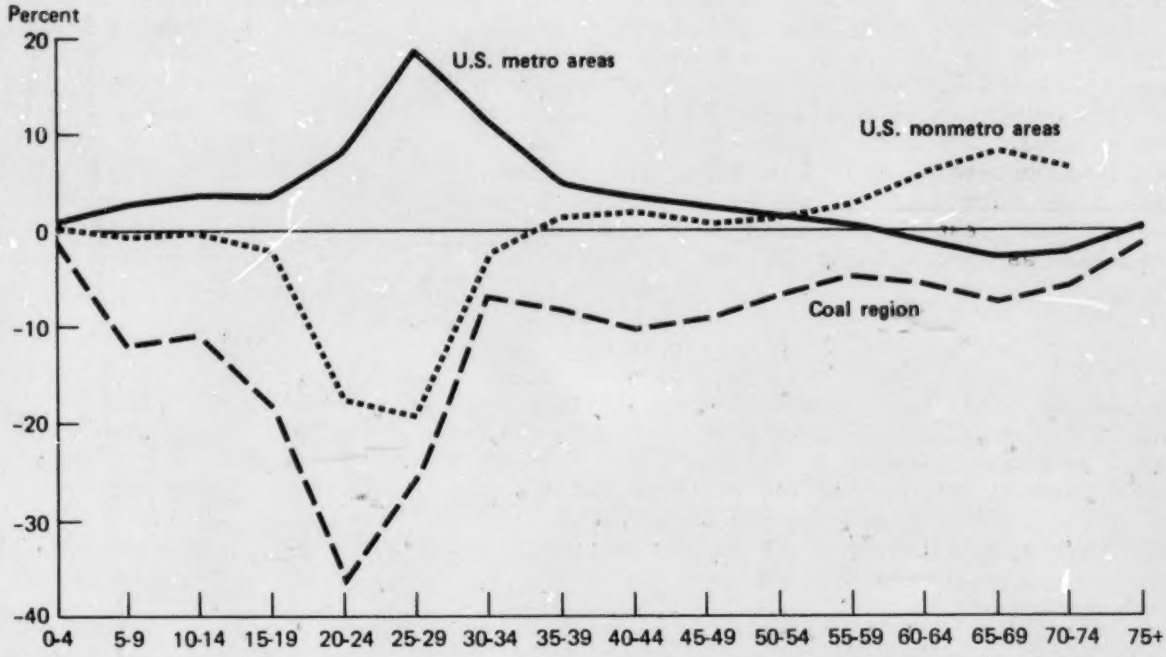
Migration Patterns

Although estimates are not available for the 1940's, the rate of net outmigration in the Northern Great Plains was 15.9 percent in the 1950's and 14.5 percent in the 1960's. 5/ Rates during the 1960's were larger than the average for all U.S. nonmetro counties (fig. 4). In each decade, net outmigration totaled over 60,000 people (app. table 3).

As with most nonmetro areas, this migration occurred mostly among younger age groups. Of the roughly 63,000 net migrants leaving during the 1960's, over half were in the 15-29-year age range (app. table 4). The highest rate of net outmigration was for persons 20-24 years old. In 1970, there were 37.1 percent fewer of those persons living in the region than in 1960.

5/ Net migration rates for the 1950's apply to the base year 1950, and the 1960's rate applies to the base year 1960.

Figure 4
Net Migration Rates by Age Groups



Source: Appendix table 4.

Net migration rates for the selected age groups varied greatly across areas of the Northern Great Plains during the 1960's. Net inmigration occurred only in the Gillette area of Wyoming, where the 1970 population of 25-29 year olds was almost double the 1960 level. During the 1960's, the total population in this area increased by 42.7 percent due to inmigration alone. At the same time, in northwestern South Dakota (SD-1), where net outmigration reduced the population by one-fourth, net outmigration for persons 20-24 years old was 60.6 percent. These extremes in net migration rates were caused by extremes in employment growth. While the Gillette area experienced boom-type growth in gas and oil exploration and production during the 1960's, the northwestern South Dakota area had no such source of employment to offset the large declines in agriculture.

Population Growth, 1970-74

Between 1970 and 1974, the population of the Northern Great Plains increased 4.9 percent, with a net inmigration of 1.2 percent, or roughly 5,000 people (app. table 3). This growth rate exceeded that of the United States as a whole. It also exceeded the growth rate of the region over the previous 30 years.

This recent turnaround in the population trend is a result of increased energy production, particularly coal production. The 1970-74 growth rate in the 20 coal-producing counties was 6.9 percent (16,088 people), with net inmigration totaling 9,100 people (app. table 5). Four-fifths of the population growth of 20,597 people occurred in counties that had coal production in 1974. Across the 6 areas that had major coal production in 1974, population grew by 20,797 people, or 11.4 percent. 6/ However, growth rates varied greatly among the 6 areas. While the population in WY-3 and WY-4 grew by 21.3 and 30.2 percent, respectively, WY-2 (the Gillette area) lost population (7.2 percent), with a net outmigration rate over the 4-year period of 11.9 percent. This population loss, despite increasing coal production, resulted from a decline in uranium, gas, and oil exploration and production.

Size and Growth of Towns

About half of the Northern Great Plains' population resides in small towns and in the open country. In 1970, over one-third of the population of the region lived in the open country, while about 11 percent lived in towns of less than 1,000 people. Of the 190 incorporated and unincorporated towns in the region in 1970, over three-fourths had populations below 1,000 people, and three out of five places were below 500 in population (app. table 6). 7/ There were only two towns with populations of over 25,000 people (Bismarck and Minot, N.D.).

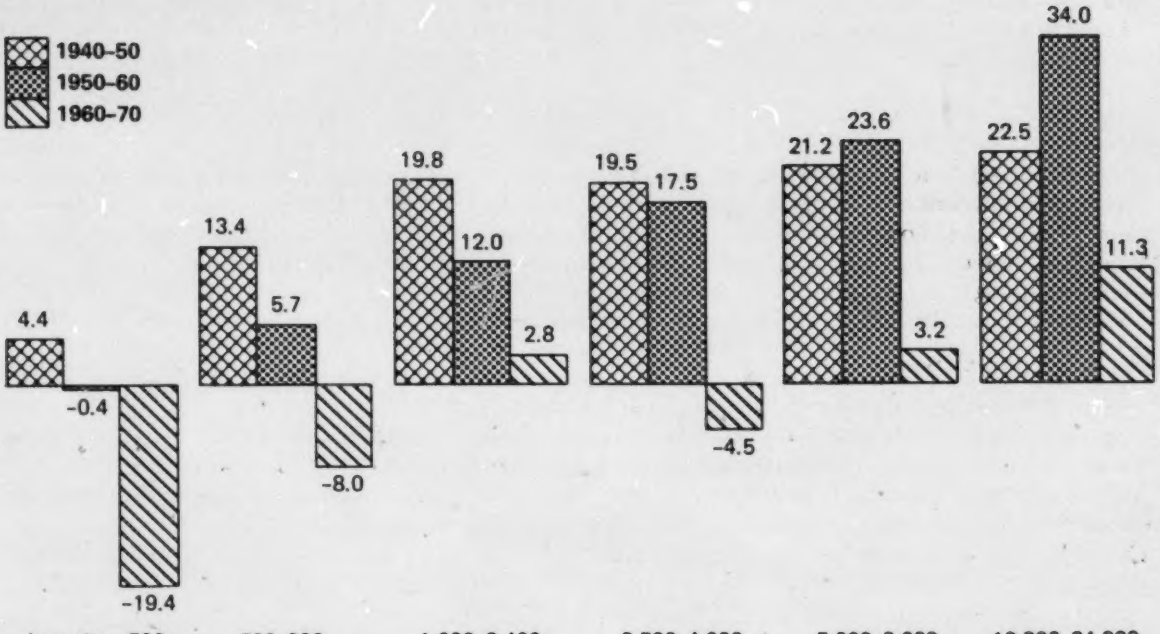
The 1940's and 1950's were periods of growth for most towns in the Northern Great Plains, with the larger towns experiencing larger growth rates. Excluding towns of less than 500 in the 1950's, all other towns underwent population increases during 1940-60.

After this growth period of natural resource development, the 1960's brought a decade of population decline for a majority of the region's small towns (less than 1,000 people), and very little change for the mid-sized towns (1,000-4,999) (fig. 5). These towns have typically been small, agricultural trade centers and the general decline in agriculture was accompanied by a population loss. The decline in Wildrose, North Dakota--in Williams County--is somewhat typical of the declines in agricultural trade centers and the overall decline in agriculture. In 1940, Wildrose's population totaled 472 people. By 1970, its population had declined to 235 people. Over the same period, agricultural employment in Williams declined from 2,459 to 925 people. The larger towns (over 5,000 people) grew moderately during the 1960's. They undoubtedly were the recipients of shifts of commercial services and of population from the smaller towns.

Despite the aggregate gains of larger towns at the expense of smaller towns, the overall configuration of towns across size groupings did not change dramatically during 1940-70 (see table 1). When towns were grouped by population ranges in 1940, then examined in 1970 for size, it was found that 80 percent of the towns did not shift to a different population range during the 30-year period. That is, they stayed within the limits of their 1940 population range.

6/ Areas that produced coal in 1974 were: MT-4, ND-2, and WY-1, -2, -3, and -4.
7/ Unincorporated places with less than 1,000 people were excluded.

Figure 5
Percentage Change in Population by Size of Town



Source: (2).

Table 1-Changes in town size, 1940 to 1970

Size of town, 1940	Total	Size of town, 1970 1/		
		Less than 1940 size	No change from 1940 size	Greater than 1940 size
	Number	Percent		
Less than 500....	98		95.9	4.1
500-999.....	36	19.4	61.1	19.4
1,000-2,499.....	25	8.0	68.0	24.0
2,500-4,999.....	4	25.0	50.0	25.0
5,000-9,999.....	6	-	33.3	66.7
10,000-24,999....	3	-	33.3	66.7
25,000 or more...	-	-	-	-
Total.....	172	5.8	80.0	14.0

1/ 190 towns were listed in the 1970 Census, but only 172 of these were listed in the 1940 Census.

Source: Census of Population, 1940-1970.

Of the 98 towns with less than 500 people in 1940, 94 had 1970 populations of less than 500 people. Of the 36 towns that had 1940 populations between 500 and 999 people, 22 were in this range in 1970, with 7 decreasing to the smaller size range and 7 increasing to more than 1,000 people.

Recent Mobility

Mobility is determined by measuring the number of people in an area who changed residence during a period of time. Mobility relates closely to the supply of jobs for an area. If there is a surplus of jobs in an area due, for example, to energy development, then mobility expressed as a percentage of people changing residence is reflected as increased inmigration. On the other hand, if jobs are scarce, then the outcome may be outmigration.

The population in the Northern Great Plains was slightly less mobile during 1965-70 than was the U.S. population (app. table 7). But of people in the region in 1970 who had changed residence during 1965-69, almost 26 percent came from another State. For the United States as a whole, inter-State mobility accounted for about 21 percent of all people who changed residence. Recent mobility trends within the study region are associated with the general population growth and changes in economic activity within the region. By this measure, mobility ranged from a low in MT-1 (29.8 percent) to a high in WY-2 (61.3 percent). Almost one-fourth of all people in WY-2 (the Gillette area) were recent arrivals from another State--that is, they had migrated into the area during 1965-69, when there was a surge in energy development in the area.

Minority Composition

In 1970, the population of the Northern Great Plains was about 95 percent white (app. table 8). Of the minorities, almost 90 percent were American Indian. Blacks numbered 1,754 people, or less than 1 percent of the total population, and three-fourths of them resided in ND-1, where Minot Air Force Base is located.

The American Indian population totaled 14,604 and was mostly clustered on reservations (fig. 6). The six reservations were Fort Peck in MT-2, Crow and Northern Cheyenne in MT-4, Fort Berthold in ND-1 and ND-2, and Standing Rock and Cheyenne River in SD-1. The distribution of the American Indian population across the 13 study areas is given in table 2.

Although American Indians constitute a small minority of the region's population, a large amount of coal deposits underlay their reservations. The total four-State area in the Northern Great Plains is 33 percent underlain by coal deposits, while 58.7 percent of the American Indian area is similarly underlain. This is demonstrated in table 3.

The extent to which these coal resources can be recovered will determine the role the American Indian has in our Nation's future energy demands. The strippable coal reserves owned by Indian tribes in the Northern Great Plains are estimated to be almost 7 billion tons, or about 9 percent of the region's total. The reserves are distributed very unevenly among the tribes, with 90 percent belonging to the Crow and the Northern Cheyenne, 73 percent to the Crow alone.

Figure 6
Indian Reservations of the Northern Great Plains Coal Region

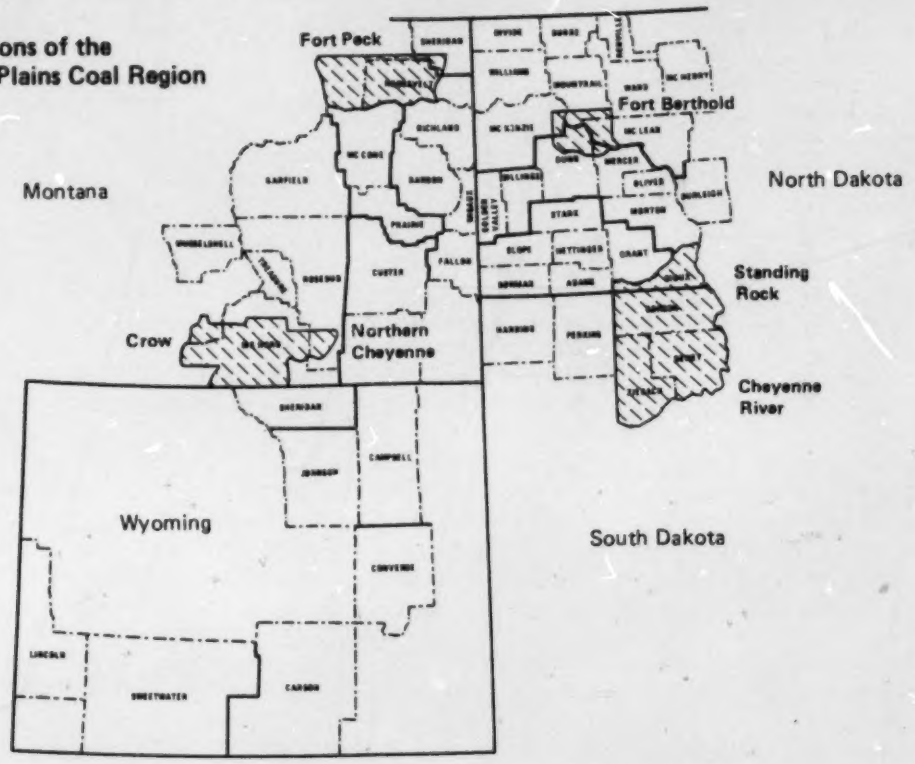


Table 2-Distribution of American Indians for the region

Area	American Indian population: Number	Share of total population: Percent
Northern Great Plains coal region, total	14,604	3.5
Montana 1	42	.7
Montana 2	3,213	8.7
Montana 3	30	.6
Montana 4	5,740	25.3
Montana 5	99	.7
North Dakota 1	2,627	2.2
North Dakota 2	1,019	1.3
North Dakota 3	73	.2
South Dakota 1	1,446	8.6
Wyoming 1	78	.4
Wyoming 2	119	.6
Wyoming 3	57	.3
Wyoming 4	61	.2

Source: App. table 8.

Table 3-American Indian reservations and their coal deposits

Indian reservation	Total area of reservation	Areas underlain by coal deposits	
	Square miles		Percent
Cheyenne River	2,210	442	20
Standing Rock	1,321	403	33
Fort Peck	1,506	1,506	100
Fort Berthold	706	706	100
Northern Cheyenne	679	679	100
Crow	2,431	1,458	60

The value of the Crow and Northern Cheyenne coal, and hence the unevenness of the distribution, is heightened because the reserves of these tribes average out as Clean Air Act compliance coal--that is, they are very low in sulfur content.

The potential revenues to the tribes from these strippable reserves, especially from the compliance coal, are enormous. The amount of wealth at stake for the Crow and Northern Cheyenne and the intensity of controversy surrounding potential development are exemplified by legal action of the Crow attempting to renegotiate leases made with coal companies during 1968-70. These leases are for tracts on which mining is not yet taking place (5).

But, even if development on these leases were permanently blocked, revenues are now flowing to the Crow from the active Sarpy Creek mine on the Crow-ceded strip, the only Indian deposit in the Northern Great Plains now being mined. These revenues, plus the potential for more--to the Northern Cheyenne as well--would open both vast opportunities and many new problems of adjustment for the tribes affected (3).

Sharp economic differences would probably develop between the Crow and Northern Cheyenne tribes and the other tribes if no coal development at all took place on these other reservations. Characteristics of the coal on these other reservations are not as favorable for early development as those of the Crow and Northern Cheyenne coal.

Possible economic differentiation among the Indian tribes might occur because of size of coal reserves and pace of development. Moreover, as the Indian might earn coal-related incomes at different rates, income differentials within tribes owning coal could sharply increase also.

Fertility, Age Structure, and Dependency Rates

In the past, the rate of natural increase for the population in the Northern Great Plains has exceeded that of nonmetro United States and that of the country

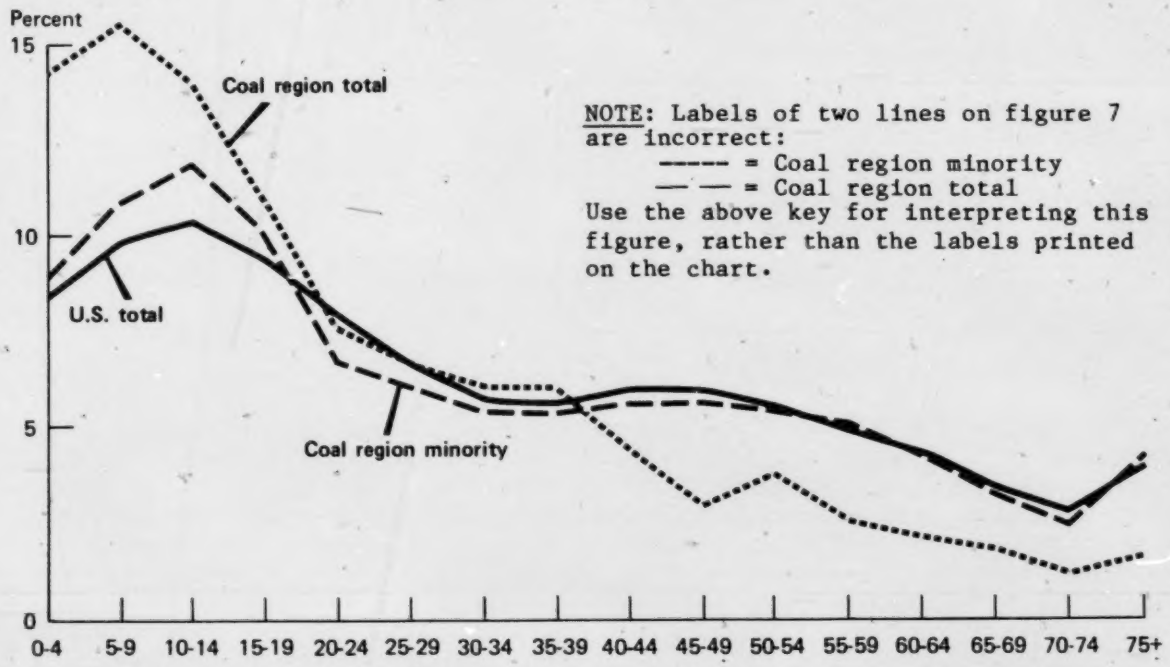
as a whole. In 1970, the number of children ever born per 1,000 women 35-44 years of age was 3,639, compared with 3,245 for nonmetro U.S. areas and 2,956 for the United States as a whole (app. table 9). Fertility rates were much greater for minority women (primarily American Indian) than for all women in the region. Minority women in the region had a fertility rate 50 percent greater than U.S. women overall.

The recent high fertility, plus heavy long-term outmigration, has resulted in a population characterized by a high proportion of very young people. In 1970, the median age was 26.5 years, but only 17.9 years for the region's minorities. These median ages compare with 28.1 years for the United States as a whole.

High dependency rates in the Northern Great Plains are also reflections of recent high fertility rates and persistent outmigration. 8/ For every 100 persons in the prime working ages in 1970, there were 92.3 persons in the dependent age groups. In the same year, the dependency rate for the United States was 79.5.

For minorities in the region, the dependency rate was 120 persons in 1970, which reflects the large number of persons under 10 years old comprising 29.7 percent of the minority population. In contrast, for the total U.S. population, only 18.3 percent were under 10 years old in 1970 (fig. 7).

Figure 7
Age Distribution of the Total and Minority Population



Source: (2).

8/ The dependency rate is the number of persons under 18 years old and the number 65 years old and older, as a percent of the working-age population of 18-64 years old.

Educational Attainment and School Enrollment

Educational attainment of the adult population indicates to some extent an area's past investment in education, and reflects current occupational and skill levels. General adaptability to changes in social and economic conditions is greatly facilitated by higher educational attainment. School enrollment rates, on the other hand, mirror present schooling investments and determine future ability of the population to adapt to changing conditions, thereby maintaining or improving the standard of living in the face of change.

The educational attainment of the region's population was very similar to that of the entire U.S. population in 1970. While median school years completed in both the region and the United States was 12.1 years, the region had smaller percentages completing high school and college than the United States as a whole. However, the region's share of the population having less than a high school education was smaller than the average for all U.S. nonmetro areas (app. table 10).

Differences in completion rates for the higher educational level are, no doubt, largely a function of past outmigration of the better educated from the Northern Great Plains, and to the lack of jobs requiring a college education. Differences favoring the region in the lower education levels are a function of age structure differences.

In general, there were no discernable differences in school enrollment rates for 7-17 year-olds in the region and in the United States as a whole (app. table 11). However, enrollment rates among 3-4-year-olds and 5-6-year-olds were substantially lower in the region, and rates for 18-19-year-olds were higher than the U.S. average. This suggests a general tendency for students in the region to start schooling late. The lower rates for the 3-4-year-olds suggest the possible lack of preschool facilities. However, the opposite is true for minority children 3-4 years old in the region. Their enrollment rate was almost twice the national rate, suggesting a higher frequency of preschool facilities on American Indian reservations.

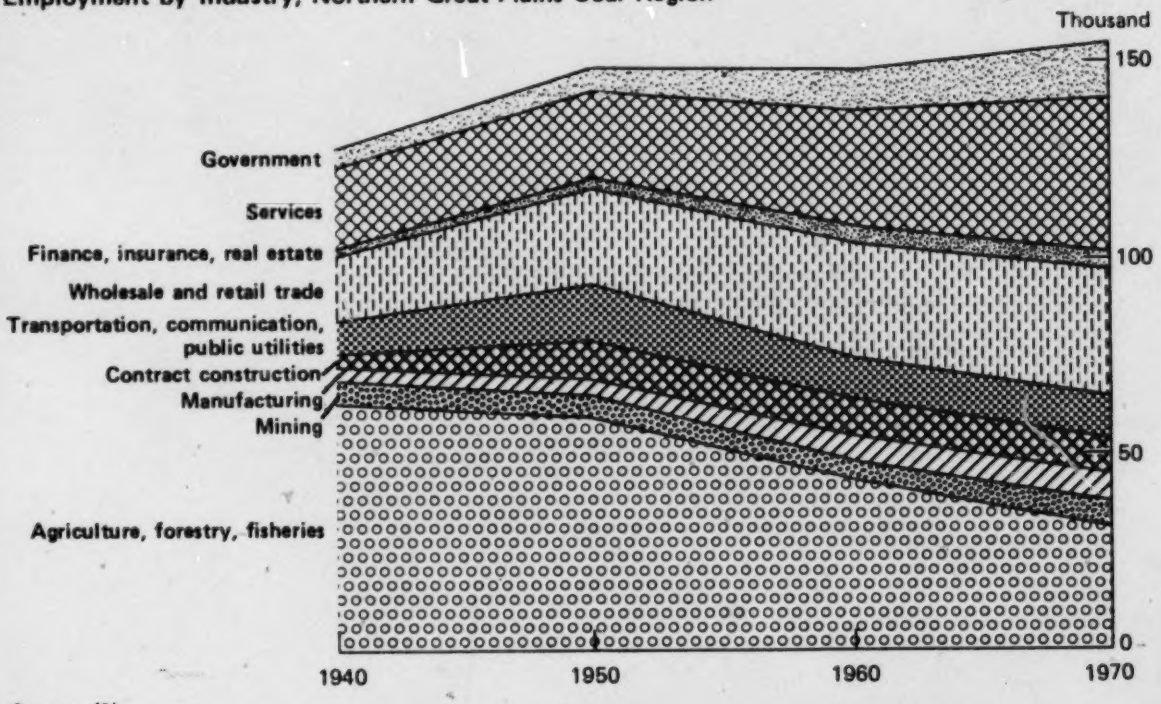
EMPLOYMENT, EARNINGS, AND LABOR FORCE

Employment Patterns, 1940-70

The region's modest population growth mirrors the insufficient growth in employment (app. table 12). During 1940-70, total employment increased by 19.6 percent (25,315 jobs), in contrast to 74.8 percent for the Nation as a whole. Given the region's population growth rate of 4 percent, the employment growth rate of 19.6 percent reflects an increased labor force participation rate for women (app. table 13). The labor force participation rate of women 16-64 years old in the region rose form 30.8 percent in 1960 to 34.7 percent in 1970.

Historically, the region has relied on agriculture as its major source of employment (fig. 8). In 1940, almost one of every two workers was employed in agriculture. Between 1940 and 1970, the number of persons employed in agriculture declined by more than 50 percent, from 63,038 to 30,819 workers. Unlike the United States as a whole, the region did not gain nonagricultural industry

Figure 8
Employment by Industry, Northern Great Plains Coal Region



Source: (2).

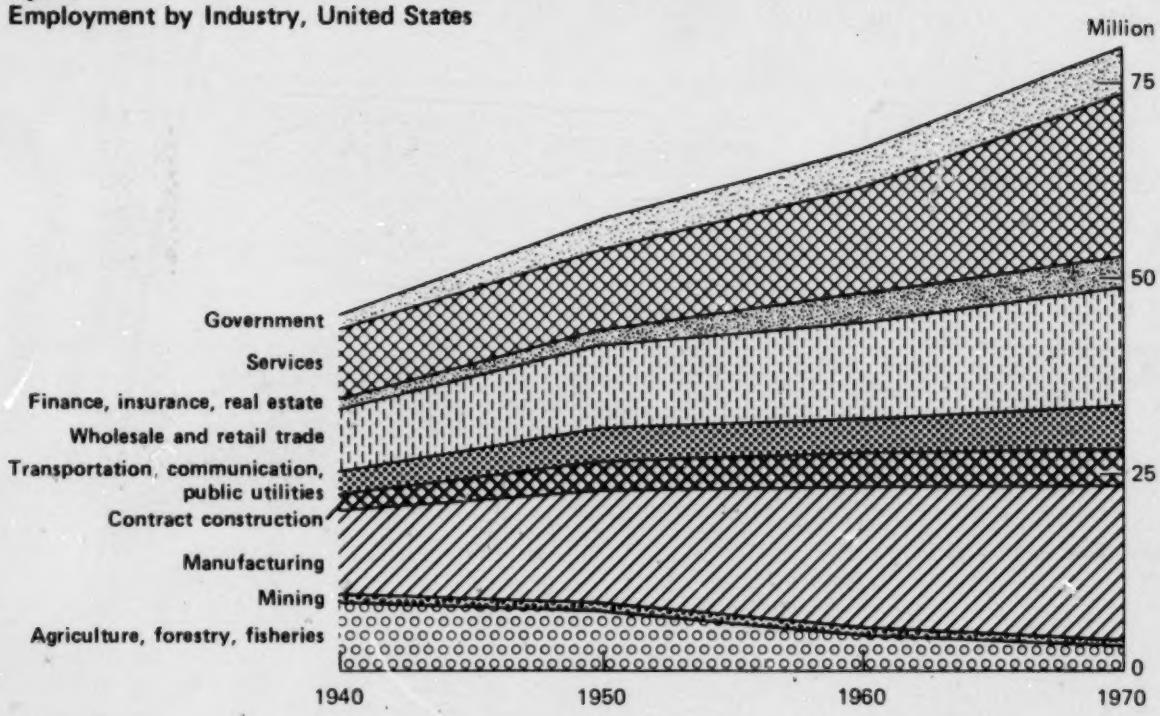
to offset the large decline in agricultural employment. For example, in the United States, agricultural employment declined by 5.8 million jobs during 1940-70 (fig. 9), but this decline in employment was more than offset by growth in manufacturing employment of 9.3 million jobs. In the region, however, for every job gained in manufacturing, roughly 10 were lost in agriculture. For all nonmetro counties of the United States, for every 10 jobs lost in agriculture, 6 were gained in manufacturing.

In the region, the basic industries of agriculture, mining, and manufacturing declined in total employment by over one-third during 1940-70. This was in contrast to a 15.8-percent growth for the United States and a loss of just over one-fifth across all U.S. nonmetro areas. However, contract construction grew at a greater rate in the region than in the United States. This growth came during the 1940's with the construction of large dams. Employment in the nonbasic industries grew during the 30-year period in the region, but at less than the national and the U.S. nonmetro rates. These smaller growth rates among the nonbasic industries resulted from a large decline in the basic industries.

Agriculture

Although the long-term decline in agricultural employment has been substantial in all areas of the Northern Great Plains, one-fifth of total employment in 1970 was still in agriculture--over twice the share for all nonmetro areas and over five times the share for the United States as a whole (app. table 14).

Figure 9
Employment by Industry, United States



Source: (2).

For the three areas within the region that are noncoal producers--MT-1 and MT-3 and SD-1--agriculture remains the major employer. In SD-1, nearly half of the work force was employed in agriculture in 1970.

Mining

Mining has not been a major source of employment in the region. It comprised only 4.2 percent of total employment in 1970. For every mining job in the region, there were roughly five jobs in agriculture. Regional mining employment declined in the 1940's and 1950's, but increased sharply during the 1960's. By 1970, regional mining employment was 5 percent greater than 1940 employment in terms of number of jobs. However, as a proportion of total employment, it was relatively less important in 1970 than in 1940. That is, the rate of increase in mining employment was less than that for total employment during 1940-70.

For 3 of the 13 areas, mining employment provided relatively few jobs. However, in 1970, mining was an important source of employment for four of the areas which represented three-fourths of the mining employment in the Northern Great Plains. Three of these areas--WY-2, WY-3, and WY-4--had from 10.3 to 20.9 percent of their work force in mining. The fourth area, ND-1, had only 2.3 percent of its employment in mining, but this represented over 1,000 jobs in 1970.

While the lack of growth in population across the region resulted from a decline in total job opportunities, especially in agriculture, population growth has been erratic, mainly due to the erratic pattern of employment in mining. Many areas of the region have grown in one decade, only to decline in the following decade when mining declined. For example, of the 8 areas of the region where mining employment declined in the 1940's, 7 had increased mining employment in the 1950's. And of these 7 areas, 5 had decreased mining employment in the 1960's.

Manufacturing

During 1940-70, manufacturing employment in the Northern Great Plains more than doubled (app. table 14). This growth rate was similar to that of all nonmetro areas, but also reflects the region's very small base in 1940. Nonetheless, in 1970, the region's manufacturing employment remained small accounting for only 4.5 percent of the work force. In 1970, roughly one-fifth of the region's manufacturing jobs were in food and kindred products and another one-fifth in the printing and publishing industries. Employment in petroleum refining comprised 12.4 percent of all manufacturing jobs in the region as compared to 1.1 percent for the United States as a whole. Jobs in chemical industries made up 8.2 percent of all manufacturing jobs in the region (9).

Manufacturing was most important in WY-4, where about 1 in 10 workers were in manufacturing and where the manufacturing of chemicals was the predominant industry. Manufacturing was least important as an employer in the three areas with the highest agricultural employment, MT-1 and MT-3 and SD-1.

Contract Construction

Contract construction accounted for 6 percent of employment in the region in 1970--about the same as for the United States as a whole and slightly less than that for all nonmetro areas. Construction work in the region expanded almost threefold during the 1940's, reached a peak in 1950, and then declined to 9,250 workers in 1970.

These northernmost areas of North Dakota--ND-1 and ND-2--accounted for most of the construction employment in 1950, and for about half of the 1970 employment. The construction of Garrison Dam from 1947 into the 1960's created the demand, which was sustained by such projects as the Minot Air Base, the Minot Minuteman Missile Complex, and the Heart Butte Dam in ND-2. In general, if ND-1 and ND-2 are excluded, the level of contract construction for the other 11 areas steadily increased in the region during 1940-70.

Contract construction, because of its project orientation, is by nature an erratic industry. When a new irrigation project or a dam is started, or a new mine is begun, there is a corresponding surge in contract construction employment. This is followed invariably, and sometimes suddenly, by a decline in contract construction employment when the project is completed.

Transportation, Communication, and Public Utilities

Between 1940 and 1970, employment in the region's transportation, communication, and public utility sectors rose 30.1 percent. This compares with 19.7 percent for growth in total regional employment. The sector represented 7.1 percent of the region's employment in 1970, in contrast to 6.6 percent for the United States as a whole. The growing importance of this sector in the region results from the national transportation and communication systems traversing this sparsely settled region. An example of this is the Burlington Northern Railroad that is increasingly needed to haul large amounts of coal out of the region.

Government Services

Employment in the government services sector increased greatly in the Northern Great Plains during the 1950's and 1960's. In the 1960's, the increase was 35.1 percent in the region, compared with 21.4 percent for all U.S. nonmetro counties. Of the region's nine industrial groupings, government employment expanded the most. It represented 9.1 percent of 1970 employment.

This large increase in government employment is directly attributable to the northern North Dakota area (ND-1), where 17.1 percent of employment was in government services. Minot Air Force Base was developed in the 1960's in this area, and the military population of 12,077 by 1970 increased the total area's population and subsequent employment considerably, especially government employment.

Employment Patterns, 1970-74

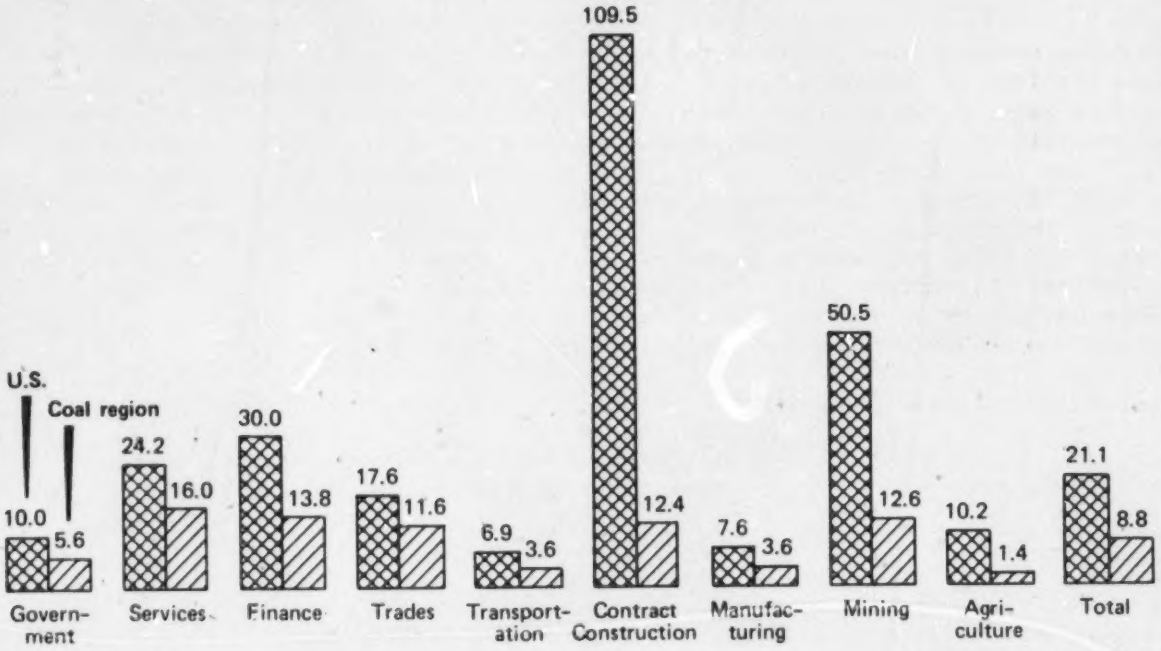
Employment in the United States increased 8.8 percent during 1970-74; growth in the Northern Great Plains was almost 2½ times faster (21.1 percent) (7). The greatest percentage increase was in the contract construction sector, where employment more than doubled (109.5 percent). The contract construction sector traditionally experiences wider fluctuations in its level of employment than do the other sectors, and the recent large advances in construction employment in the region stem largely from increased mining activity (fig. 10). Mining employment in 1970-74 rose by an unprecedented 50.5 percent in the region, and by 12.6 percent in the United States.

Large employment increases in contract construction and mining induced greater levels of secondary employment. The finance, service, and trades industries experienced large changes in employment during 1970-74, with employment growth in the finance industry more than doubling the U.S. growth rate.

Earnings by Sex and Occupation

In 1969, male workers in the Northern Great Plains had higher median earnings in all occupational groupings when compared with the average for all U.S. nonmetro workers (app. table 15). At the same time, their median earnings

Figure 10
Changes in Employment by Sector, 1970-74



Source: (7).

were less than those of U.S. workers in all nonfarm occupations. However, median earnings of workers in farm occupations in the region exceeded those of farm workers for the United States. Overall, the highest median earnings were achieved in the Wyoming areas.

The region's female workers, on the other hand, had median earnings in 1969 of $2,234, which compares with $3,413 for all female workers in the United States and $2,742 for female workers in the U.S. nonmetro areas. In all areas of the region, the female workers earned less than their U.S. and U.S. nonmetro counterparts. Only in the clerical occupations in the central North Dakota area, with its greater presence of government employment, did the female worker attain higher median earnings than her U.S. nonmetro counterpart.

Female workers in the region earned a little more than one-third of the comparable male earnings (35.2 percent). For the U.S. female, median earnings were 45.4 percent of those for males. Thus, the region's female workers not only had lower median earnings than all U.S. female workers, but their earnings as a proportion of male earnings were below the U.S. level.

Past Labor Force Growth and Future Potential

In 1970, the labor force of the Northern Great Plains totaled 161,336 persons 14 years or older, of which about one-third were women. During the 1960's, the number of females in the region's labor force rose 21.4 percent. In contrast, male employment fell 4.8 percent. The increase of females in the

labor force is related to changing attitudes, and to growth of nonbasic industries in the region in contrast to the industries of agriculture and mining, which historically have been male dominated.

Twelve areas in the region experienced losses in the male labor force during the 1960's. However, for 5 of these 12 areas, male employment losses were more than offset by large gains in the female work force. Only one area, WY-2, containing the towns of Gillette and Buffalo, had a positive change in the size of its male labor force. In the 1960's, the male labor force in this area rose by 2,021 workers (61.6 percent), while the basic and male-dominated industry of mining increased more than threefold, from 413 to 1,500 workers. This increase in mining employment, no doubt, induced large increases in the trades and services industries, which contributed to the 89.9-percent gain in female employment for the area. Table 4 illustrates the growth or decline of the labor force in the 1960's, as well as potential growth in the 1970's. 9/

Table 4-Actual and potential growth in the regional labor force

Region	Actual growth in labor force, 1960-70		Potential growth in labor force, 1970-80	
	Males	Females	Males	Females
	Percent			
United States	9.7	37.5	14.1	21.8
Metropolitan	13.1	38.9	13.6	21.2
Nonmetropolitan	1.0	33.4	15.7	23.5
Northern Great Plains coal region	-4.8	21.4	18.1	30.9
Montana 1	-11.5	11.9	14.0	20.3
Montana 2	-9.8	26.9	22.2	39.4
Montana 3	-18.5	6.6	13.6	27.7
Montana 4	-10.0	18.0	15.3	25.7
Montana 5	-10.6	33.4	21.7	32.8
North Dakota 1	-2.3	18.3	18.0	31.3
North Dakota 2	-1.2	23.2	19.9	31.7
North Dakota 3	-12.6	11.2	22.2	34.5
South Dakota 1	-17.9	15.3	21.0	35.3
Wyoming 1	-9.7	22.2	9.2	18.7
Wyoming 2	61.6	89.9	18.0	35.7
Wyoming 3	-13.6	6.9	10.5	22.6
Wyoming 4	-4.4	25.4	14.5	26.0

Source: Potential growth data from the cooperative project of ESCS and the University of Georgia, which is headed by Gladys Bowles.

9/ Potential growth represents the number of entrants into the labor force (mainly people who move into the labor force ages, and additions resulting from changes in labor participation rates) as well as exits from the labor force because of aging and mortality. These calculations for potential labor force growth assume no migration during the decade and are for 18-64 year olds, while the actual labor force growth rate is for 14 years and over.

Potential labor force figures indicate how many jobs must be provided to halt migration. If growth in jobs is expected to exceed the growth in the labor force, potential labor force figures indicate the extent of net inmigration needed. The supply of jobs in the region will need to increase by 18.1 percent during the 1970's for the male worker, and 30.9 percent for the female worker, in order to prevent migration or increased unemployment. If the supply of jobs does not increase, the surplus labor may migrate out of the region. Whether this growth in the labor supply stays in the region, or migrates out, as has been the case in the past, depends on the region's capacity to provide jobs.

The 1970-74 increase in total jobs in the region (21.1 percent) reversed the previous 20-year direction of migration. Net inmigration during this recent period was about 5,100 people. The inmigration was clearly evident in the counties experiencing increased or continued large coal production, where the demand for labor was greatest. The effect of increased coal production on population is exemplified in WY-4, where coal production increased 133 percent during 1970-74. In Sweetwater County (WY-4), coal production quadrupled, contributing to the 41-percent gain in population resulting from a large inmigration rate of 35.6 percent.

INDICATORS OF WELL-BEING

Income and Poverty

Median family income is one of the commonly used measures of well-being. An indicator of lack of well-being is the percent of people for a given area that falls below a designated level of income, such as the poverty threshold.

In 1969, the region as a whole had a higher level of median family income and lower incidence of poverty when compared with all U.S. nonmetro areas. For American Indians in the region, however, median family incomes were lower and the rates of poverty were higher than for all nonmetro U.S. areas and for the United States as a whole. The region's median family income in 1969 was $8,068, reflecting a 68-percent increase during the 1960's, which was similar to the income increase for the United States as a whole (app. table 16).

Though median family income for the region was greater than for all U.S. nonmetro areas, it was less than that of the United States as a whole. There were three areas within the region with lower median family incomes than the average for all nonmetro areas: MT-4, ND-3, and SD-1. In MT-4 and SD-1, there were large American Indian populations, and ND-3 was still dependent to a large degree upon agriculture. The median family income for American Indians in the region was only 63.8 percent of the median family income for all families in the region. The Wyoming areas had the highest family incomes, reflecting the impact of higher wages in the mining, manufacturing, and construction sectors.

About 15.6 percent of the region's population lived in poverty in 1969. Approximately 41.3 percent of American Indians lived in households whose incomes were below the poverty threshold. Only two areas, MT-4 and SD-1, had higher levels of poverty than the U.S. nonmetro figure of 20.2 percent. These two areas contained about one-half the region's American Indian population.

Family Structure

In 1970, the region had a higher prevalence of the husband-wife family, and a low percentage of female-headed families, when compared to the United States as a whole and to all nonmetro counties. American Indian families, however, were less likely to be husband-wife families and twice as likely to be female-headed families. The traditional U.S. family unit, a husband-wife family, represented 86 percent of all family types in 1970 (app. table 17). For the region, this figure was 89.9 percent for all families, surpassing the U.S. figure as well as the figures for the metro and nonmetro United States. All 13 areas within the region had similar high levels of husband-wife type families.

The region's frequency of female-headed families was far below that for U.S. metro and nonmetro areas and for the United States overall. Only the MT-4 area had a larger proportion of female-headed families than the U.S. average. In MT-4, American Indians comprised 25.3 percent of the population, which suggests a higher incidence of female heads among Indian families. American Indian families in the region were less likely to be husband-wife families, but three times more likely to have a female head, than the region overall. Moreover, Indian children (less than 18 years old) were several times more likely to be living with neither parent.

Housing Conditions

Quality of housing is another indicator of well-being. An objective method to gage the quality of housing is to measure the presence or absence of complete indoor plumbing. Historically, as indicated by this measure, metropolitan counties have had better housing than nonmetropolitan counties. In 1970, only 3.2 percent of the housing units in metropolitan counties were without complete indoor plumbing. The nonmetropolitan rate was 13.4 percent (app. table 18). In the region the rate was lower--10.6 percent--partly because of a greater decline of substandard houses during the 1960's.

Again, as in the case of income, poverty, and family structure, differences in housing quality among areas within the region can be traced to differences in the incidence of American Indian populations. In 1970, rates of substandard housing were highest in SD-1 (21 percent) and MT-4 (16.7 percent). In Corson and Dewey Counties of SD-1, which encompass the Standing Rock and Cheyenne River Indian Reservations, almost one-third of the housing lacked complete plumbing in 1970. Across the region, high rates of substandard housing in 1970 coincided with large Indian populations as illustrated in table 5.

Except for the areas of large Indian populations, the region's coal counties enjoyed slightly better housing than other nonmetropolitan counties in the United States in 1970. For instance, WY-1, especially Sheridan County, had a a very low rate of substandard housing (5.4 percent).

Table 5-Housing conditions of American Indians

Indian reservation in coal counties	Coal area	County	All housing	Substandard housing
			Number	Percent
Fort Peck	MT-2	Roosevelt	3,327	12.4
Crow	MT-4	Big Horn	2,868	14.0
Northern Cheyenne	MT-4	Rosebud	2,019	19.2
Fort Berthold	ND-1	McLean	3,934	20.0
Fort Berthold	ND-1	McKenzie	2,085	20.9
Fort Berthold	ND-2	Dunn	1,554	27.0
Fort Berthold	ND-2	Mercer	2,161	15.7
Cheyenne River	SD-1	Dewey	1,546	29.6
Standing Rock	SD-1	Corson	1,429	32.3
Total			20,923	19.6

IMPLICATIONS

The Baseline Economy

The economy of the Northern Great Plains tends to be specialized in agriculture. The agricultural sector is highly developed in the sense that farms and ranches are large and highly capitalized operations requiring a minimum of hired labor. The region is sparsely settled, with few large towns and a small labor force to serve as a base for growth. Coal mining and energy conversion will compete for labor, and the demands for labor will be large relative to the existing work force. It appears likely that labor for the energy extraction and conversion operations, and the firms which will service individuals, will come from migration. If this is true, then wages will tend to be bid up in order to attract and hold labor and entrepreneurs.

Community Services

Community services of existing towns will be impacted by large and rapid growth. The legacy of natural resource exploitation in the region has followed a pattern of rapid growth followed by declines. A knowledge of such past patterns may temper the decisions of community leaders and entrepreneurs. In addition, the uncertainty of coal development and the temporary nature of mineral extraction at each prime site could contribute to a series of impacts on several small towns which may be followed by declines. Exceptions will be the sites of highly capitalized conversion facilities, which will operate for long periods of time.

Three types of impacts on local government services can be felt. First and most obvious is the expansion due to an increase in population. Second and less obvious is the impact due to higher wage bills for construction and operation of local government services. Third is the anticipation that new types of services and transitions from part-time and voluntary systems may be needed.

Regional Growth

Coal mining and energy conversion in the region have at least three important implications. First, this development will not contribute to a unified system of central places throughout the region; it will be isolated and scattered. Second, the temporary nature of coal mining at each mineral site could contribute to isolated booms followed by retrenchments. Third, the impacts due to population changes could be large relative to the present sizes of towns and populations which presently exist.

Coal mining and energy conversion facilities can result in growth of existing small towns and development of isolated new towns. Coal mining will not be evenly distributed throughout the region if it is assumed that the prime deposits will be mined first. Furthermore, the very nature of mineral extraction, when sites are scattered, exhausts the mineral resource at each site. A single major town may not serve as a service center and focus of growth if mining is isolated, scattered, and in most instances temporary over the life of a mineral deposit.

Minority Participation

The minority populations of the region can participate in the economic growth that results from coal mining and energy conversion. The Northern Cheyenne and Crow Indian tribes own 8.1 percent of strippable coal reserves in the Northern Great Plains. That much of the primary labor required will be skilled and semiskilled, and that wages could be relatively high indicate some of the benefits to be gained. Some members of the minority populations in the region, however, view these benefits as short term and mixed, because of the effect upon the land, the social system, and future life styles.

Other Benefits and Costs

The incidence of the benefits and costs of coal development and energy conversion will be different for permanent residents than for inmigrants. Much of the western coal is owned by the Federal Government. In many cases, the surface owner is not the mineral resource owner. The rights and life of the surface owners in such cases can be disrupted. Current business operators in each case will be competing for labor that will be in short supply. Small businessmen in the service sector could find that competing regional and national firms will move into the growing towns. Some permanent residents feel, correctly or not, that they will carry part of the tax burden required for growth of community services, while other permanent residents expect better quality in government and private services, lower costs of those services, a wider range of available services, and, over the long term, a lower tax bill.

National Policy Implications

An efficient market system dictates that those who benefit pay the full cost of the good or service. Those who feel hurt in such a system have recourse in the market by changing jobs or products, and they have recourse through the

administrative, judicial, and legislative systems of the Nation. In the first instance, the efficiency of the market system will benefit if the full costs of coal extraction and conversion is paid by energy users. In the second instance, local people and governments can use the legal and legislative means available to forestall coal development. If coal utilization is a high national priority, it appears to be in the best interests of the Nation to assess the full costs of its exploitation and compensate those who lose. This ethic is not unusual to coal located in the Northern Great Plains. But it appears that conditions prevailing in the region may dictate a pragmatic course for national leaders.

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Appendix table 1-Coal production for U.S. metro and nonmetro counties and the Northern Great Plains coal region, selected years, 1960-75

Area	1960	1966	1970	1974	1975
	1,000 short tons				
United States	415,512	533,881	602,932	603,406	640,342
Metropolitan	89,400	103,107	116,239	108,990	N.A. 1/
Nonmetropolitan	326,112	430,774	486,693	494,416	N.A.
Northern Great Plains coal region, total 2/	4,846	7,619	16,300	42,242	55,309
Montana 1	6	2	- 3/	-	-
Montana 2	W	W	322	330	298
Montana 3	-	-	-	-	-
Montana 4	96	W	3,124	13,775	22,513
Montana 5	W	W	1	1	2
North Dakota 1	1,195	W	W	908	739
North Dakota 2	1,122	W	4,180	6,141	5,677
North Dakota 3	260	W	W	392	2,099
South Dakota 1	-	-	-	-	-
Wyoming 1	382	326	1,465	1,023	1,005
Wyoming 2	459	475	W	4,051	4,075
Wyoming 3	678	W	W	11,430	14,181
Wyoming 4	493	W	1,800	4,191	4,720

1/ N.A. = Not available.
2/ Areas may not add to total because of the distribution of undisclosed data labeled (W).
3/ (-) Dash indicates zero in this and succeeding tables.

Source: U.S. Department of Interior, coal preprint from U.S. Bureau of Mines Minerals Yearbook, 1960, 1966, 1970, 1974, and 1975.

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Appendix table 2-Major population centers of the Northern Great Plains coal region, 1970

Area	County	Major population center		
		Over 25,000	10,000-24,999	1,000-9,999
Montana 1	Sheridan	--	--	Plentywood
Montana 2	Dawson	--	--	Glendive
	Fallon	--	--	Baker
	Richland	--	--	Sidney
	Roosevelt	--	--	Poplar
				Wolf Point
	Wibaux	--	--	--
Montana 3	McCone	--	--	--
	Prairie	--	--	--
Montana 4	Big Horn	--	--	Hardin
	Garfield	--	--	--
	Musselshell	--	--	Roundup
	Rosebud	--	--	Forsyth
	Treasure	--	--	--
Montana 5	Custer	--	--	Miles City
	Powder River	--	--	--
North Dakota 1	Burke	--	--	--
	Divide	--	--	Crosby
	McHenry	--	--	Velva
	McKenzie	--	--	--
	McLean	--	--	Garrison
	Montrail	--	--	New Town
				Parshall
				Stanley
	Ward	Minot	--	Kenmare
	Williams	--	Williston	Tioga
North Dakota 2	Billings	--	--	--
	Burleigh	Bismarck	--	--
	Dunn	--	--	--
	Golden Valley	--	--	Beach
	Mercer	--	--	Beulah
				Hazen
	Morton	--	Mandan	Glen Ullin
				Hebron
	Oliver	--	--	--

Continued--

Appendix table 2-Major population centers of the Northern Great Plains coal region, 1970--Continued

Area	County	Major population center		
		Over 25,000	10,000-24,999	1,000-9,999
North Dakota 3	Adams	--	--	Hettinger
	Bowman	--	--	Bowman
	Grant	--	--	--
	Hettinger	--	--	Mott
	Slope	--	--	--
	Stark	--	Dickinson	Belfield
South Dakota 1	Corson	--	--	--
	Dewey	--	--	--
	Harding	--	--	--
	Perkins	--	--	--
Wyoming 1	Sheridan	--	Sheridan	--
Wyoming 2	Campbell	--	--	Gillette
	Johnson	--	--	Buffalo
Wyoming 3	Carbon	--	--	Rawlins
			--	Saratoga
	Converse	--	--	Douglas
			--	Glenrock
Wyoming 4	Lincoln	--	--	Afton
			--	Kemmerer
	Sweetwater	--	Rock Springs	Green River

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population, 1970, PC(1), Number of Inhabitants.

Appendix table 3-Total population and population changes for metro and nonmetro counties and the Northern Great Plains coal region, 1940-74

Area	Total population					Components of population change								
						1950-60			1960-70			1970-74		
	1940	1950	1960	1970	1974	Total change	Natural increase	Net migration	Total change	Natural increase	Net migration	Total change	Natural increase	Net migration
	Thousands					Percent								
United States	132,165.6	151,698.8	179,323.1	203,212.8	211,392.3	18.2	16.7	1.5	13.3	11.6	1.7	4.0	3.0	1.0
Metropolitan	80,386.1	100,081.3	126,455.4	147,996.3	153,046.0	26.4	17.4	8.9	17.0	12.3	4.7	3.4	3.1	0.3
Nonmetropolitan	51,779.5	51,617.5	52,867.7	55,216.5	58,346.3	2.4	15.4	-13.0	4.4	10.1	-5.6	5.7	2.7	3.0
Northern Great Plains coal region, total	407.2	412.6	430.4	423.3	443.9	4.3	20.3	-15.9	-1.6	12.9	-14.5	4.9	3.7	1.2
Montana 1	7.8	6.7	6.4	5.8	5.3	-3.2	17.2	-20.5	-10.5	7.3	-17.8	-8.3	0.4	-8.7
Montana 2	34.5	34.6	40.2	37.0	36.6	16.3	26.0	-9.7	-8.1	13.2	-21.3	-1.1	3.5	-4.6
Montana 3	6.2	5.6	5.6	4.6	4.6	0.1	20.4	-20.4	-17.9	7.1	-25.0	-0.7	1.4	-2.2
Montana 4	26.8	25.4	24.4	22.3	25.2	-3.8	17.0	-20.8	-7.0	12.3	-19.3	13.1	5.9	7.2
Montana 5	13.6	15.4	15.7	15.0	14.5	2.3	17.9	-15.6	-4.3	9.1	-13.4	-3.6	1.8	-5.3
North Dakota 1	103.6	111.4	123.1	122.0	123.0	10.4	21.1	-10.7	-0.9	14.6	-15.5	0.9	4.0	-3.1
North Dakota 2	70.8	69.2	75.4	78.2	83.7	8.9	22.7	-13.8	3.8	14.8	-11.1	7.0	4.1	2.9
North Dakota 3	42.6	41.6	41.5	38.9	38.7	-0.2	22.3	-22.5	-6.3	14.3	-20.5	-0.5	2.8	-3.3
South Dakota 1	22.0	20.2	19.4	16.8	17.2	-4.0	21.2	-25.2	-13.5	15.3	-28.7	2.5	3.1	-0.6
Wyoming 1	19.2	20.2	19.0	17.8	19.3	-5.9	10.1	-16.0	-6.0	2.3	-8.3	8.1	0.3	7.8
Wyoming 2	11.0	9.5	11.3	18.5	17.2	18.8	17.3	1.5	63.6	14.0	49.6	-7.2	4.6	-11.9
Wyoming 3	19.3	21.7	21.3	19.3	23.4	-1.7	16.2	-18.0	-9.4	8.5	-17.9	21.3	2.6	18.7
Wyoming 4	29.7	31.0	26.9	27.0	35.2	-13.2	16.7	-29.9	0.3	11.8	-11.4	30.2	5.4	24.8

Source: Census of Population, 1940, 1950, 1960, 1970. The 1974 population estimates taken from Current Population Reports, Series P-26.

Appendix table 4-Net migration, by selected age groups for metro and nonmetro counties and the Northern Great Plains coal region, 1960-70

Area	All ages		15-19 years old		20-24 years old		25-29 years old	
	Number	Percent 1/	Number	Percent	Number	Percent	Number	Percent
United States	3,213,887	1.6	240,610	1.3	-284,391	-1.7	488,007	3.8
Metropolitan	4,952,393	3.8	389,637	3.2	839,195	8.0	1,478,649	18.5
Nonmetropolitan	-1,738,506	-2.5	-149,027	-2.2	-1,123,586	-18.0	-990,642	-19.8
Northern Great Plains coal region, total	-62,943	-12.9	-9,906	-18.9	-16,941	-37.1	-8,670	-25.9
Montana 1	-1,172	-16.9	-259	-32.3	-484	-67.4	-167	-36.5
Montana 2	-8,606	-18.9	-1,402	-26.7	-2,371	-53.3	-867	-29.3
Montana 3	-1,399	-23.2	-234	-33.3	-390	-60.1	-214	-49.8
Montana 4	-4,742	-17.3	-806	-27.3	-1,248	-46.4	-528	-27.8
Montana 5	-2,135	-12.4	-197	-11.0	-656	-43.2	-358	-30.1
North Dakota 1	-19,521	-13.8	-2,782	-18.5	-2,409	-18.9	-2,266	-23.6
North Dakota 2	-8,337	-9.6	-1,471	-15.7	-3,057	-38.0	-1,475	-24.1
North Dakota 3	-8,514	-18.0	-816	-15.5	-1,900	-41.1	-1,637	-45.1
South Dakota 1	-5,470	-24.6	-844	-33.8	-1,321	-60.6	-674	-44.0
Wyoming 1	-1,586	-8.2	-186	-9.7	-969	-51.8	-569	-41.0
Wyoming 2	5,552	42.7	380	29.4	278	24.3	735	97.0
Wyoming 3	-3,914	-16.9	-642	-27.1	-1,056	-49.6	-268	-18.1
Wyoming 4	-3,099	-10.3	-647	-20.0	-1,358	-46.8	-382	-19.3

1/ The migration figures shown here differ from those shown in table 3. Net migration data of table 3 were taken directly from the preliminary components of Population Changes Estimates, published by the Bureau of Census in 1950, 1960, and 1970. The figures here result from using revised (but not published to date) components of population change estimates. The revised migration rates were expressed as percentages of the 1970 expected survivors of the 1960 population, plus births during the decade, and not the 1960 population, as is the case in table 3.

Source: Tabulation completed by Gladys K. Bowles. Individual county migration figures are published in: Bowles, Gladys K., Calvin Beale, and Everett Lee. "Net Migration of the Population, 1960-70, by Age, Sex, and Color," Economic Research Service, University of Georgia and National Science Foundation, cooperating.

Appendix table 5-Number of mines, coal production, population, and migration for Northern Great Plains coal counties and areas, 1970 and 1974

Area	Mines		Coal production			Population			Net migration, 1970-74	
	1970	1974	1970	1974	Change	1970	1974 1/	Change		
	No.	No.	---1,000 tons--		Pct.	No.	No.	Pct.	No.	Pct.
Montana 1										
Sheridan	-	-	-	-	-	5,779	5,300	-8.0	-500	-8.2
Montana 2										
Dawson	-	-	-	-	-	11,269	10,900	-2.9	-800	-7.1
Fallon	-	-	-	-	-	4,050	3,900	-4.8	-300	-8.6
Richland	1	1	322	330	2.5	9,837	9,900	0.9	-200	-2.5
Roosevelt	-	-	-	-	-	10,365	10,500	1.4	-300	-2.6
Wibaux	-	-	-	-	-	1,465	1,400	-4.8	-100	-6.6
Montana 3										
McCone	-	-	-	-	-	2,875	2,700	-4.8	-200	-7.2
Prairie	-	-	-	-	-	1,752	1,900	8.0	100	6.1
Montana 4										
Big Horn	-	2	-	8,315	-	10,057	10,500	4.4	-100	-0.9
Garfield	-	-	-	-	-	1,796	1,600	-8.9	-200	-10.9
Musselshell	4	2	28	20	-28.6	3,734	4,200	12.7	500	12.6
Rosebud	2	2	3,096	5,440	+75.7	6,032	7,700	27.3	1,300	21.0
Treasure	-	-	-	-	-	1,069	1,200	14.3	100	10.7
Montana 5										
Custer	-	-	-	-	-	12,174	12,300	1.3	2/	-0.4
Powder River	1	1	1	1	-	2,862	2,200	-23.9	-800	-27.0
Montana coal counties	8	8	3,447	14,106	309.2	85,116	86,200	5.8	-	-
North Dakota 1										
Burke	3/	1	W	348	-	4,739	4,300	-8.3	-400	-8.4
Divide	-	-	-	-	-	4,564	4,200	-8.2	-400	-8.5
McHenry	-	-	-	-	-	8,977	8,800	-2.4	-300	-3.8
McKenzie	-	-	-	-	-	6,127	6,300	2.9	2	0.3
McLean	1	-	19	-	-	11,251	11,500	2.2	100	1.0
Montrail	-	-	-	-	-	8,437	8,400	2	-100	-1.5
Ward	W	1	W	548	-	58,560	60,800	3.8	-1,600	-2.7
Williams	1	1	5	12	140.0	19,301	18,700	-3.3	-1,100	-5.8
North Dakota 2										
Billings	-	-	-	-	-	1,198	1,100	-9.5	-200	-12.9
Burleigh	-	-	-	-	-	40,714	45,400	11.5	2,600	6.4
Dunn	-	-	-	-	-	4,895	4,800	-1.3	-200	-3.3
Golden Valley	-	-	-	-	-	2,611	2,600	-	2	-0.2
Mercer	3	3	3,378	4,062	20.2	6,175	6,400	3.7	100	1.9
Morton	-	-	6	-	-	20,310	21,200	4.2	200	1.2
Oliver	3	1	796	2,079	161.0	2,322	2,200	-5.2	-200	-7.1
North Dakota 3										
Adams	1	2	5	24	380.0	2,832	3,800	-	-100	-2.5
Bowman	W	1	W	223	-	3,901	3,900	0.4	2	-1.1
Grant	2	1	8	3	-37.5	5,009	5,000	-0.3	-100	-2.5
Hettinger	-	-	-	-	-	5,075	4,900	-2.7	-300	-5.1
Slope	-	-	-	-	-	1,484	1,300	-10.8	-200	-13.7
Stark	3	2	125	161	28.8	19,613	19,800	1.0	-600	-3.0
North Dakota coal counties	20	13	5,639	7,463	32.3	239,095	245,400	2.6	-	-
South Dakota 1										
Carson	-	-	-	-	-	4,994	5,100	1.4	-200	-4.3
Dewey	-	-	-	-	-	5,170	5,900	13.5	400	7.2
Harding	-	-	-	-	-	1,855	1,700	-5.7	-100	-7.4
Perkins	-	-	-	-	-	4,769	4,500	-4.8	-200	-5.2
South Dakota coal counties	-	-	-	-	-	16,788	17,200	2.4	-	-
Wyoming 1										
Sheridan	2	2	1,465	1,023	-30.2	17,852	19,300	7.8	400	7.8
Wyoming 2										
Campbell	W	2	W	4,051	-	12,957	11,900	-8.5	-1,900	-14.4
Johnson	-	-	-	-	-	5,587	5,300	-4.7	-200	-6.2
Wyoming 3										
Carbon	W	7	W	8,743	-	13,354	16,300	22.4	2,500	18.4
Converse	2	1	1,844	2,687	45.7	5,938	7,100	20.4	1,100	18.4
Wyoming 4										
Lincoln	2	2	1,583	3,353	111.8	8,640	9,300	8.2	200	2.5
Sweetwater	2	2	217	838	286.2	18,391	25,900	41.0	6,500	35.6
Wyoming coal counties	10	16	7,214	20,695	186.9	82,719	95,100	8.1	-	-
Northern Great Plains coal counties, total	38	37	16,300	42,265	159.2	423,303	443,900	4.9	-	-

1/ County estimates rounded to nearest hundred.
2/ 2 indicates less than 50 persons or less than 0.05 percent.
3/ W indicates legal reporting constraints.

Source: Bureau of Mines Minerals Yearbooks, 1970 and 1974, and Census of Population, Current Population Reports, Series P-26, 1970 and 1974, and app. table 3.

Appendix table 6-Population, by size of place, United States and the Northern Great Plains coal region, 1970

Size of place	United States				Northern Great Plains coal region			
	Places		Population		Places		Population	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
25,000 or more	916	4.4	91,107,639	44.8	2	1.0	66,993	16.3
10,000-24,999	1,385	6.7	21,431,385	10.5	1/ 5	2.6	1/ 57,292	13.9
2,500-9,999	4,134	19.9	20,972,100	10.3	10	5.3	53,599	13.0
1,000-2,499	4,530	21.8	7,232,847	3.6	28	14.7	43,070	10.5
Less than 1,000	9,803	47.2	4,003,790	2.0	145	76.3	44,061	10.7
Less than 500	6,509	31.3	1,632,083	0.8	116	61.0	23,472	5.7
Less than 100	N.A. 2/	N.A.	N.A.	N.A.	35	18.4	1,297	0.3
Outside places 3/	-	-	58,464,165	28.8	-	-	146,211	35.6
Total	20,768	100.0	203,211,926	100.0	190	100.0	1/ 411,226	100.0

1/ Excludes Minot AFB: Population of 12,077.
2/ N.A. = Not available.
3/ Unincorporated places of less than 1,000 and population in the open countryside.

Source: Census of Population, 1970.

Appendix table 7-Residence of population 5 years prior to census for metro and nonmetro counties and Northern Great Plains coal region, 1970

Area	Same house	Different house			Abroad or not reported
		Same county	Different county		
			Same State	Different State	
	Percent				
United States	53.0	23.3	8.4	8.6	6.7
Metropolitan	51.9	23.9	7.9	9.0	7.3
Nonmetropolitan	55.9	21.7	9.7	7.7	5.0
Northern Great Plains coal region, total	55.5	20.4	9.6	10.5	4.1
Minority	41.1	27.0	11.0	13.4	7.4
Montana 1	70.2	16.6	4.3	7.1	1.8
Montana 2	58.1	22.4	8.5	8.5	2.6
Montana 3	68.4	18.0	7.7	4.0	1.9
Montana 4	58.2	19.0	10.6	8.4	3.9
Montana 5	51.0	21.3	12.3	10.1	5.3
North Dakota 1	51.5	21.2	9.1	13.0	5.2
North Dakota 2	56.7	22.3	11.8	6.2	3.0
North Dakota 3	63.4	18.2	9.9	5.4	3.1
South Dakota 1	66.3	16.7	6.7	7.0	3.3
Wyoming 1	54.9	21.1	5.7	14.1	4.2
Wyoming 2	38.7	16.6	14.1	24.5	6.2
Wyoming 3	54.8	19.2	9.5	12.2	4.2
Wyoming 4	54.9	18.9	7.0	14.3	5.0

Source: Census of Population, 1970.

Appendix table 8-Minority composition of the population in metro and nonmetro counties and the Northern Great Plains coal region, 1970

Area	Total population	Black		American Indian	
	Number	Number	Percent	Number	Percent
United States	203,212,832	22,580,289	11.11	792,730	.39
Metropolitan	147,996,284	16,984,471	11.47	330,193	.22
Nonmetropolitan	55,216,548	5,595,818	10.13	462,537	.84
Northern Great Plains coal region, total	423,303	1,754	.41	14,604	3.45
Montana 1	5,779	1	.02	42	0.73
Montana 2	37,001	7	.02	3,213	8.69
Montana 3	4,633	-	-	30	.65
Montana 4	22,275	12	.05	5,740	25.77
Montana 5	15,036	7	.05	99	.66
North Dakota 1	121,956	1,307	1.07	2,627	2.15
North Dakota 2	78,209	28	.04	1,019	1.30
North Dakota 3	38,914	3	.01	73	.19
South Dakota 1	16,781	4	.02	1,446	8.62
Wyoming 1	17,852	39	.22	78	.44
Wyoming 2	18,544	5	.03	119	.64
Wyoming 3	19,292	100	.52	57	.30
Wyoming 4	27,031	241	.89	61	.23

Source: U.S. Department of Commerce, Bureau of the Census, Census of the Population 1970, "Race of the Population by County: 1970," PC(S1)-104.

Appendix table 9-Median age, dependency rate, and fertility rate, metro and nonmetro counties, and the Northern Great Plains coal region, 1970

Area	Median age	Dependency rate 1/	Fertility rate 2/
	Years	Percent	Number
United States, total	28.1	79.5	2,956
Metropoltian	28.0	77.1	2,859
Nonmetropolitan	28.3	86.5	3,245
Northern Great Plains coal region, total	26.5	92.3	3,639
Minority	17.9	120.0	4,520
Montana 1	31.1	94.4	3,810
Montana 2	26.3	100.8	3,804
Montana 3	29.3	90.1	3,955
Montana 4	26.9	93.9	3,549
Montana 5	28.4	97.7	3,587
North Dakota 1	25.4	88.0	3,567
North Dakota 2	25.9	92.8	3,586
North Dakota 3	24.6	97.0	4,211
South Dakota 1	24.9	110.5	3,894
Wyoming 1	35.5	86.2	3,042
Wyoming 2	25.3	89.8	3,569
Wyoming 3	29.9	85.4	3,031
Wyoming 4	28.3	89.4	3,586

1/ The dependency rate is the population under 18 years and 65 years and over, as a percent of the working age population of 18-64 years.

2/ The fertility rate is the number of children ever born per 1,000 women between the ages of 35 and 44 years old.

Source: Census of Population 1970.

Appendix table 10-Educational attainment of the population 25 years old and over, metro and nonmetro counties, and the Northern Great Plains coal region, 1970

Area	Percent completing		Median years completed
	High school	College	
	Percent		Years
United States	52.3	10.7	12.1
Metropolitan	55.1	11.9	12.2
Nonmetropolitan	45.0	7.4	11.2
Northern Great Plains coal region, total	51.8	7.9	12.1
Minority	33.4	3.3	10.0
Montana 1	50.2	8.4	12.0
Montana 2	49.7	6.3	11.9
Montana 3	50.3	5.3	12.0
Montana 4	47.0	7.9	11.5
Montana 5	56.5	8.2	12.2
North Dakota 1	53.7	7.7	12.1
North Dakota 2	48.5	8.8	11.5
North Dakota 3	43.6	7.0	10.1
South Dakota 1	43.3	5.8	10.7
Wyoming 1	60.4	11.2	12.3
Wyoming 2	58.8	7.3	12.2
Wyoming 3	59.8	8.4	12.3
Wyoming 4	57.0	9.3	12.2

Source: Census of Population, 1970.

Appendix table 11-School enrollment rates, by age groups and minority status, United States and the Northern Great Plains coal region, 1970

Age	United States		NGP coal region	
	Total	Minority	Total	Minority
	Percent			
School enrollment:				
3-4	12.5	14.8	4.5	20.0
5-6	72.4	68.7	54.6	67.1
7-13	97.3	95.8	97.2	96.8
14-15	95.9	93.8	94.7	92.5
16-17	89.3	84.6	91.7	80.6
18-19	56.6	49.2	60.2	38.7
20-21	30.7	20.8	20.7	9.8
22-24	14.6	10.4	8.0	3.6
25-34	6.1	5.6	3.0	.9

Source: Census of Population, 1970.

Appendix table 12-Trends in employment, by industry, nonmetro counties and the Northern Great Plains coal region, 1940-70

Industry	United States				Nonmetropolitan				NGP coal region			
	1940	1950	1960	1970	1940	1950	1960	1970	1940	1950	1960	1970
	Thousands								Number			
Basic industries:												
Agriculture, forestry, and fisheries	8,678.9	7,194.5	4,524.9	2,916.4	6,489.8	5,347.2	3,204.7	1,942.2	63,038	59,062	45,672	30,819
Mining	928.2	941.3	669.9	631.9	576.3	613.9	418.7	359.0	6,092	5,818	5,233	6,398
Manufacturing	10,739.6	14,785.7	18,205.7	20,019.8	2,236.3	3,164.1	3,990.2	5,003.2	3,137	4,240	5,808	6,937
Total	20,346.7	22,921.5	23,400.5	23,568.1	9,302.5	9,125.2	7,613.6	7,304.4	72,267	69,120	53,713	44,154
Nonbasic industries:												
Contract construction	2,110.4	3,524.4	4,025.8	4,587.1	618.9	1,053.2	1,141.8	1,325.2	3,497	9,944	9,310	9,250
Transport, communication, and public utilities	3,163.8	4,503.3	4,625.0	5,197.0	768.1	1,093.8	1,053.3	1,109.7	8,365	14,028	11,490	10,880
Wholesale and retail trade	7,682.0	10,742.9	12,306.3	15,607.9	1,908.3	2,720.3	3,108.4	3,666.0	16,880	25,076	28,875	32,001
Finance, insurance, real estate	1,487.9	1,941.4	2,790.5	3,848.1	194.4	274.8	410.5	558.5	1,749	2,323	3,974	4,512
Services	8,782.6	10,282.1	14,213.0	20,292.6	2,466.1	2,773.9	3,588.6	4,790.5	20,517	22,660	30,335	39,221
Government (including military)	1,802.5	3,559.3	5,011.7	6,207.0	400.9	698.9	1,080.8	1,312.3	5,498	6,328	10,414	14,070
Total	25,029.2	34,553.4	42,972.3	55,739.7	6,356.7	8,614.9	10,383.4	12,762.2	56,506	80,359	94,398	109,934
Total employment	45,375.9	57,474.9	66,372.8	79,307.8	15,659.2	17,740.1	17,997.0	20,066.6	128,773	149,479	148,111	154,088
	1940-50	1950-60	1960-70	1940-50	1950-60	1960-70	1940-50	1950-60	1960-70			
	Percentage change											
Basic industries:												
Agriculture, forestry, and fisheries	-17.2	-37.1	-35.5	-17.6	-40.1	-39.4	-6.3	-27.8	-27.8			
Mining	1.4	-28.8	-5.7	6.5	-31.8	-14.3	-4.5	-10.1	22.3			
Manufacturing	37.7	23.1	10.0	41.5	26.1	25.4	35.2	37.0	19.4			
Total	12.7	2.1	0.7	-1.9	-16.6	-4.1	4.6	-22.3	-17.8			
Nonbasic industries:												
Contract construction	67.0	14.2	13.9	70.2	8.4	16.1	184.4	-6.4	-0.6			
Transport, communication, and public utilities	42.3	2.7	12.4	42.4	-3.7	5.4	67.7	-18.1	-5.3			
Wholesale and retail trade	39.8	14.6	26.8	42.6	14.3	17.9	48.6	15.1	10.8			
Finance, insurance, real estate	30.5	43.7	37.9	41.4	49.4	36.1	32.8	71.1	13.5			
Services	17.1	38.2	42.8	12.5	29.4	33.5	10.4	33.9	29.3			
Government (including military)	97.5	40.8	23.9	74.3	54.6	21.4	15.1	64.6	35.1			
Total	38.1	14.6	29.7	35.5	20.5	22.9	42.2	17.5	16.5			
Total employment	26.7	15.5	19.5	13.1	1.4	11.5	16.1	0.9	4.0			

Source: Census of Population, 1940, 1950, 1960 and 1970.

Appendix table 13-Labor force status of population 14 years or older, metro and nonmetro counties, and Northern Great Plains coal region, by sex, 1960 and 1970

Area	Persons in labor force						Labor force participation rate			
	Males			Females			Males		Females	
	1970	Change 1960-70		1970	Change 1960-70		1970	1960	1970	1960
	Total	Total	Pct.	Total	Total	Pct.	Percent			
United States	52,076,663	4,608,942	9.7	30,820,770	8,411,010	37.5	72.9	77.4	39.6	34.5
Metropolitan	38,545,773	4,469,922	13.1	23,282,274	6,523,084	38.9	74.4	78.9	40.8	36.2
Nonmetropolitan	13,530,890	139,020	1.0	7,538,496	1,887,926	33.4	68.8	73.8	36.1	30.3
Northern Great Plains coal region, total	109,238	-5,450	-4.8	52,098	9,201	21.4	72.8	78.4	34.7	30.8
Montana 1	1,528	-198	-11.5	516	55	11.9	71.4	75.8	24.9	22.4
Montana 2	9,179	-999	-9.8	4,527	959	26.9	71.9	77.9	34.6	28.1
Montana 3	1,336	-304	-18.5	503	31	6.6	77.1	84.9	30.5	26.3
Montana 4	5,627	-626	-10.0	2,678	408	18.0	72.1	75.5	34.6	29.3
Montana 5	3,776	-448	-10.6	2,216	555	33.4	70.4	75.4	40.1	31.8
North Dakota 1	32,429	-753	-2.3	13,977	2,163	18.3	73.2	78.9	32.8	29.9
North Dakota 2	19,610	-239	-1.2	10,527	1,983	23.2	74.1	80.7	37.2	34.2
North Dakota 3	9,535	-1,376	-12.6	4,496	454	11.2	70.2	79.7	32.5	30.8
South Dakota 1	4,147	-906	-17.9	1,936	257	15.3	72.2	77.4	35.1	28.3
Wyoming 1	4,385	-469	-9.7	2,695	490	22.2	64.3	68.4	38.1	32.6
Wyoming 2	5,302	2,021	61.6	2,062	976	89.9	79.9	81.8	33.4	29.4
Wyoming 3	5,247	-823	-13.6	2,446	157	6.9	73.5	78.6	35.0	32.8
Wyoming 4	7,137	-330	-4.4	3,519	713	25.4	74.2	79.4	36.6	32.1

Source: Census of Population, 1960 and 1970.

Appendix table 14-Employment by industry in metro and nonmetro counties and the Northern Great Plains coal region, 1940-70

Area	Employment				Percent of total employment			
	1940	1950	1960	1970	1940	1950	1960	1970
	Agriculture, forestry, and fisheries							
	Thousands				Percent of total			
United States	8,678.9	7,194.5	4,524.9	2,916.4	19.1	12.5	6.8	3.7
Metropolitan	2,189.0	1,847.2	1,320.2	974.3	7.4	4.6	2.7	1.6
Nonmetropolitan	6,489.9	5,347.2	3,204.7	1,942.1	41.4	30.1	17.8	9.7
	Number							
Northern Great Plains coal region, total	63,038	59,062	42,671	30,819	49.0	39.5	28.8	20.0
Montana 1	1,374	1,354	971	601	61.1	58.5	47.0	30.3
Montana 2	5,319	4,909	3,593	2,749	51.7	40.4	27.8	21.1
Montana 3	1,248	1,359	1,019	790	67.7	63.7	50.0	43.8
Montana 4	4,347	3,927	2,915	2,227	51.7	45.3	36.7	28.2
Montana 5	1,693	1,690	1,184	1,145	37.6	27.4	21.2	20.1
North Dakota 1	19,276	16,740	11,128	7,841	54.8	42.0	26.6	17.7
North Dakota 2	10,430	10,546	7,750	5,060	48.9	40.9	29.1	17.6
North Dakota 3	7,604	7,486	6,384	4,026	61.5	52.5	44.2	29.8
South Dakota 1	3,784	4,489	3,080	2,703	63.7	61.2	48.8	46.6
Wyoming 1	1,706	1,330	981	806	27.7	18.5	14.7	11.9
Wyoming 2	2,283	1,687	1,261	1,015	58.2	45.0	29.7	14.1
Wyoming 3	2,247	1,957	1,324	1,065	33.4	23.3	17.0	14.7
Wyoming 4	1,727	1,588	1,082	791	17.5	13.9	11.2	7.8
	Mining							
	Thousands				Percent of total			
United States	928.1	941.3	669.9	631.9	2.0	1.6	1.0	.8
Metropolitan	351.9	327.4	251.1	272.9	1.2	.8	.5	.5
Nonmetropolitan	576.3	613.0	418.8	359.0	3.7	3.5	2.3	1.8
	Number							
Northern Great Plains coal region, total	6,092	5,818	5,233	6,398	4.7	3.9	3.5	4.2
Montana 1	37	12	25	69	1.6	.5	1.2	3.5
Montana 2	58	42	422	552	.6	.3	3.3	4.2
Montana 3	9	5	16	0	.5	.2	.8	.0
Montana 4	692	741	350	184	8.2	8.5	4.4	2.3
Montana 5	22	41	66	221	.5	.7	1.2	3.9
North Dakota 1	502	318	1,307	1,003	1.4	.8	3.1	2.3
North Dakota 2	322	287	328	191	1.5	1.1	1.2	.7
North Dakota 3	150	89	229	185	1.2	.6	1.6	1.4
South Dakota 1	46	26	27	10	.8	.4	.4	.2
Wyoming 1	358	468	58	182	5.8	6.5	.9	2.7
Wyoming 2	62	120	413	1,500	1.6	3.2	9.7	20.9
Wyoming 3	558	754	475	748	8.3	9.0	6.1	10.3
Wyoming 4	3,276	2,915	1,517	1,553	33.3	25.4	15.8	15.4

Continued

Appendix table 14-Employment by industry in metro and nonmetro counties and the Northern Great Plains coal region, 1940-70--Continued

Area	Employment				Percent of total employment			
	1940	1950	1960	1970	1940	1950	1960	1970
	Manufacturing							
	Thousands				Percent of total			
United States	10,739.6	14,785.8	18,205.7	20,019.9	23.7	25.7	27.4	25.2
Metropolitan	8,503.2	11,621.7	14,215.4	15,016.7	28.6	29.2	29.4	25.3
Nonmetropolitan	2,236.3	3,164.0	3,990.2	5,003.1	14.3	17.8	22.2	24.9
	Number							
Northern Great Plains coal region, total	3,137	4,240	5,808	6,937	2.4	2.8	3.9	4.5
Montana 1	19	33	24	25	.8	1.4	1.2	1.3
Montana 2	220	301	529	619	2.1	2.5	4.1	4.8
Montana 3	10	10	53	21	.5	.5	2.6	1.2
Montana 4	194	174	276	575	2.3	2.0	3.5	7.3
Montana 5	90	170	183	140	2.0	2.8	3.3	2.5
North Dakota 1	697	945	1,337	1,589	2.0	2.4	3.2	3.6
North Dakota 2	593	805	1,455	1,451	2.8	3.1	5.5	5.0
North Dakota 3	207	290	299	545	1.7	2.0	2.1	4.0
South Dakota 1	49	57	127	65	.8	.8	2.0	1.1
Wyoming 1	337	348	346	300	5.5	4.8	5.2	4.4
Wyoming 2	49	66	92	233	1.2	1.8	2.2	3.2
Wyoming 3	462	792	657	446	6.9	9.4	8.4	6.2
Wyoming 4	210	249	430	928	2.1	2.2	4.5	9.2
	Contract construction							
	Thousands				Percent of total			
United States	2,110.4	3,524.4	4,025.8	4,587.1	4.7	6.1	6.1	5.8
Metropolitan	1,491.5	2,471.2	2,883.9	3,261.9	5.0	6.2	6.0	5.5
Nonmetropolitan	618.9	1,053.2	1,141.8	1,325.2	4.0	5.9	6.3	6.6
	Number							
Northern Great Plains coal region, total	3,497	9,944	9,310	9,250	2.7	6.7	6.3	6.0
Montana 1	39	92	84	103	1.7	4.0	4.1	5.2
Montana 2	371	813	850	678	3.6	6.7	6.6	5.2
Montana 3	60	116	164	64	3.3	5.4	8.0	3.5
Montana 4	324	410	365	455	3.9	4.7	4.6	5.8
Montana 5	232	563	370	393	5.2	9.1	6.6	6.9
North Dakota 1	653	3,089	2,755	2,125	1.9	7.7	6.6	4.8
North Dakota 2	464	1,549	1,654	2,427	2.2	6.0	6.2	8.4
North Dakota 3	143	653	585	587	1.2	4.6	4.0	4.3
South Dakota 1	131	425	280	184	2.2	5.8	4.4	3.2
Wyoming 1	270	577	657	430	4.4	8.0	9.9	6.3
Wyoming 2	221	309	423	558	5.6	8.3	10.0	7.8
Wyoming 3	302	928	554	483	4.5	11.0	7.1	6.7
Wyoming 4	287	420	569	763	2.9	3.7	5.9	7.6

Continued

Appendix table 14-Employment by industry in metro and nonmetro counties and the Northern Great Plains coal region, 1940-70--Continued

Area	Employment				Percent of total employment			
	1940	1950	1960	1970	1940	1950	1960	1970
	Transportation, communication, public utilities							
	Thousands				Percent of total			
United States	3,163.8	4,503.3	4,625.0	5,197.0	7.0	7.8	7.0	6.6
Metropolitan	2,395.8	3,409.4	3,571.7	4,087.3	8.1	8.6	7.4	6.9
Nonmetropolitan	768.0	1,093.8	1,053.3	1,109.7	4.9	6.2	5.9	5.5
	Number							
Northern Great Plains coal region, total	8,365	14,028	11,490	10,880	6.5	9.4	7.8	7.1
Montana 1	63	85	89	86	2.8	3.7	4.3	4.3
Montana 2	837	1,349	1,360	1,263	8.1	11.1	10.5	9.7
Montana 3	58	98	86	101	3.1	4.6	4.2	5.6
Montana 4	346	595	507	385	4.1	6.9	6.4	4.9
Montana 5	628	919	525	375	14.0	14.9	9.4	6.6
North Dakota 1	2,072	3,528	3,294	2,758	5.9	8.8	7.9	6.2
North Dakota 2	1,171	1,942	1,598	2,154	5.5	7.5	6.0	7.5
North Dakota 3	435	769	632	620	3.5	5.4	4.4	4.6
South Dakota 1	162	277	249	227	2.7	3.8	3.9	3.9
Wyoming 1	582	740	568	455	9.4	10.3	8.5	6.7
Wyoming 2	95	168	200	528	2.4	4.5	4.7	7.4
Wyoming 3	753	1,130	997	839	11.2	13.4	12.8	11.6
Wyoming 4	1,163	2,428	1,385	1,089	11.8	21.2	14.4	10.8
	Wholesale and retail trade							
	Thousands				Percent of total			
United States	7,682.0	10,742.9	12,306.3	15,607.9	16.9	18.7	18.5	19.7
Metropolitan	5,773.7	8,022.6	9,197.9	11,941.9	19.4	20.2	19.0	20.2
Nonmetropolitan	1,908.3	2,720.3	3,108.4	3,666.0	12.2	15.3	17.3	18.3
	Number							
Northern Great Plains coal region, total	16,880	25,076	28,875	32,001	13.1	16.8	19.5	20.8
Montana 1	285	367	334	445	12.7	15.9	16.2	22.4
Montana 2	1,331	2,084	2,693	2,930	12.9	17.1	20.9	22.5
Montana 3	143	211	248	387	7.8	9.9	12.2	21.4
Montana 4	935	1,187	1,257	1,296	11.1	13.7	15.8	16.4
Montana 5	719	1,242	1,211	1,214	16.0	20.1	21.7	21.3
North Dakota 1	4,826	7,279	8,492	9,366	13.7	18.3	20.3	21.1
North Dakota 2	2,776	4,495	5,179	6,255	13.0	17.5	19.4	21.7
North Dakota 3	1,422	2,309	2,692	2,999	11.5	16.2	18.6	22.2
South Dakota 1	525	809	929	835	8.8	11.0	14.7	14.4
Wyoming 1	1,134	1,443	1,391	1,614	18.4	20.1	20.9	23.8
Wyoming 2	418	581	766	1,324	10.6	15.5	18.1	18.4
Wyoming 3	945	1,250	1,560	1,385	14.0	14.9	20.0	19.1
Wyoming 4	1,421	1,819	2,123	1,951	14.4	15.9	22.1	19.4

Continued

Appendix table 14-Employment by industry in metro and nonmetro counties and the Northern Great Plains coal region, 1940-70--Continued

Area	Employment				Percent of total employment			
	1940	1950	1960	1970	1940	1950	1960	1970
	Finance, insurance, real estate							
	Thousands				Percent of total			
United States	1,487.9	1,941.4	2,790.5	3,848.1	3.3	3.4	4.2	4.9
Metropolitan	1,293.5	1,666.5	2,380 0	3,289.6	4.4	4.2	4.9	5.6
Nonmetropolitan	194.4	274.8	410.5	558.5	1.2	1.5	2.3	2.8
	Number							
Northern Great Plains coal region, total	1,749	2,323	3,974	4,512	1.4	1.6	2.7	2.9
Montana 1	18	20	37	73	.8	.9	1.8	3.7
Montana 2	130	184	272	397	1.3	1.5	2.1	3.1
Montana 3	16	20	17	43	.9	.9	.8	2.4
Montana 4	60	103	141	152	.7	1.2	1.8	1.9
Montana 5	84	110	163	189	1.9	1.8	2.9	3.3
North Dakota 1	471	587	1,160	1,201	1.3	1.5	2.8	2.7
North Dakota 2	416	533	1,116	1,166	2.0	2.1	4.2	4.0
North Dakota 3	143	194	301	369	1.2	1.4	2.1	2.7
South Dakota 1	53	78	156	111	.9	1.1	2.5	1.9
Wyoming 1	120	184	233	214	1.9	2.6	3.5	3.2
Wyoming 2	41	55	84	233	1.0	1.5	2.0	3.2
Wyoming 3	86	110	107	169	1.3	1.3	1.4	2.3
Wyoming 4	111	145	187	195	1.1	1.3	1.9	1.9
	Services							
	Thousands				Percent of total			
United States	8,782.6	10,282.1	14,213.0	20,292.6	19.4	17.9	21.4	25.6
Metropolitan	6,316.4	7,508.2	10,624.4	15,502.1	21.3	18.9	22.0	26.2
Nonmetropolitan	2,466.1	2,773.9	3,588.6	4,790.5	15.7	15.6	19.9	23.9
	Number							
Northern Great Plains coal region, total	20,517	22,660	30,335	39,221	15.9	15.2	20.5	25.6
Montana 1	318	257	419	463	14.1	11.1	20.3	23.3
Montana 2	1,625	2,046	2,566	3,088	15.8	16.8	19.9	23.7
Montana 3	217	223	321	320	11.8	10.4	15.7	17.7
Montana 4	1,140	1,095	1,643	2,046	13.6	12.6	20.7	25.9
Montana 5	759	1,142	1,288	1,593	16.9	18.5	23.1	27.9
North Dakota 1	5,593	5,952	8,433	10,824	15.9	14.9	20.3	24.4
North Dakota 2	3,470	3,857	5,373	7,705	16.3	15.0	20.2	26.8
North Dakota 3	1,844	2,047	2,613	3,698	14.9	14.4	18.1	27.4
South Dakota 1	914	878	1,123	1,294	15.4	12.0	17.8	22.3
Wyoming 1	1,461	1,796	2,133	2,495	23.7	25.0	32.0	36.8
Wyoming 2	644	635	837	1,598	16.4	17.0	19.7	22.3
Wyoming 3	1,128	1,187	1,726	1,709	16.8	14.1	22.1	23.6
Wyoming 4	1,404	1,545	1,810	2,388	14.3	13.5	18.8	23.7

Continued

Appendix table 14-Employment by industry in metro and nonmetro counties and the Northern Great Plains coal region, 1940-70--Continued

Area	Employment				Percent of total employment			
	1940	1950	1960	1970	1940	1950	1960	1970
	Government							
	Thousands				Percent of total			
United States	1,802.5	3,559.2	5,011.7	6,207.0	4.0	6.2	7.6	7.8
Metropolitan	1,401.6	2,860.3	3,931.0	4,894.7	4.7	7.2	8.1	8.3
Nonmetropolitan	400.9	698.9	1,080.8	1,312.3	2.6	3.9	6.0	6.5
	Number							
Northern Great Plains coal region, total	5,498	6,328	10,414	14,070	4.3	4.2	7.0	9.1
Montana 1	95	94	83	119	4.2	4.1	4.0	6.0
Montana 2	407	438	618	727	4.0	3.6	4.8	5.6
Montana 3	82	92	116	79	4.4	4.3	5.7	4.4
Montana 4	363	444	482	587	4.3	5.1	6.1	7.4
Montana 5	271	295	594	438	6.0	4.8	10.6	7.7
North Dakota 1	1,092	1,442	3,906	7,580	3.1	3.6	9.3	17.1
North Dakota 2	1,676	1,740	2,182	2,388	7.9	6.8	8.2	8.3
North Dakota 3	420	422	711	479	3.4	3.0	4.9	3.5
South Dakota 1	281	301	344	375	4.7	4.1	5.4	6.5
Wyoming 1	198	290	294	279	3.2	4.0	4.4	4.1
Wyoming 2	113	124	167	193	2.9	3.3	3.9	2.7
Wyoming 3	248	295	393	403	3.7	3.5	5.0	5.6
Wyoming 4	262	351	524	423	2.6	3.1	5.4	4.2

Source: Census of Population, 1940, 1950, 1960 and 1970.

Appendix table 15-Median earnings by occupation and sex, for metro and nonmetro counties and the Northern Great Plains coal region, 1969

Area	Male							Female		
	Total including military	Professional, managerial, and kindred	Craftsmen, foremen, and kindred	Operatives including transport	Laborers except farm	Farmers and farm manager	Farm laborers except unpaid and foremen	Total including military	Clerical and kindred	Operatives including transport
	Dollars									
United States	7,515	10,899	8,109	6,694	4,434	4,727	2,468	3,413	4,068	3,495
Metropolitan	8,008	11,460	8,538	7,087	4,837	5,067	2,756	3,660	4,255	3,632
Nonmetropolitan	6,128	8,808	6,918	5,783	3,761	4,641	2,327	2,742	3,279	3,266
Northern Great Plains coal region	6,353	8,866	7,252	6,399	4,432	5,073	2,930	2,234	3,045	2,127
Montana 1	6,653	8,255	4,667	6,975	5,176	7,293	3,000	2,603	3,310	1,500
Montana 2	6,590	8,226	7,318	6,654	5,087	5,672	2,495	2,036	3,226	2,406
Montana 3	5,679	7,400	5,469	3,885	1,500	6,095	3,333	1,560	1,075	500
Montana 4	4,973	7,427	6,074	4,856	4,457	3,851	2,942	2,320	2,793	2,185
Montana 5	6,581	9,103	7,518	6,197	4,875	5,899	3,461	2,387	2,793	1,667
North Dakota 1	6,253	8,891	7,006	5,983	4,322	4,888	2,367	2,182	2,842	2,180
North Dakota 2	6,401	9,185	7,262	5,521	4,213	4,577	3,172	2,614	3,434	2,456
North Dakota 3	5,374	8,081	6,139	5,628	2,708	4,656	2,619	1,831	2,530	2,136
South Dakota 1	4,570	7,238	4,447	4,300	1,500	5,029	2,547	1,619	2,647	1,000
Wyoming 1	6,714	9,525	6,670	6,452	4,029	6,175	3,606	2,463	2,944	1,625
Wyoming 2	8,178	11,148	9,018	8,281	5,559	7,727	3,759	2,193	2,419	1,478
Wyoming 3	7,308	9,342	8,490	8,259	5,500	5,478	2,842	2,021	2,532	1,864
Wyoming 4	7,464	9,275	8,364	7,000	5,367	6,187	3,326	2,277	3,021	2,172

Source: Census of Population, 1970.

Appendix table 16-Median family income and incidence of poverty for metro and nonmetro counties and Northern Great Plains coal region, 1959 and 1969

Area	Median family income			Poverty				
	1969	1959	Percent change 1959-69	1969		1959		Percent change 1959-69
	Dollars	Dollars	Percent	Number	Percent	Number	Percent	Percent
United States, total	9,590	5,660	69.4	27,124,985	13.7	38,684,635	22.1	-29.9
Metropolitan	10,406	6,211	67.5	16,333,893	11.3	20,985,856	17.0	-22.2
Nonmetropolitan	7,615	4,278	78.0	10,791,092	20.2	17,698,779	34.2	-39.1
Northern Great Plains coal region, total	8,068	4,799	68.1	64,353	15.6	112,552	26.3	-42.8
Minority 1/	5,147	2,633	95.5	7,247	41.3	-	-	-
Montana 1	8,605	4,550	89.1	655	11.5	1,549	23.2	-57.7
Montana 2	8,357	4,838	72.7	5,400	14.7	10,993	27.7	-50.9
Montana 3	7,933	4,136	91.8	732	15.9	1,774	31.8	-58.7
Montana 4	6,912	4,408	56.8	5,222	23.7	7,547	31.4	-30.8
Montana 5	8,298	5,115	62.2	1,754	11.9	3,157	20.5	-44.4
North Dakota 1	7,827	4,755	64.6	17,704	15.1	32,051	26.3	-44.8
North Dakota 2	8,224	4,627	77.7	11,550	15.1	21,881	29.1	-47.2
North Dakota 3	7,099	4,246	67.2	7,362	19.6	13,529	32.3	-45.6
South Dakota 1	6,242	3,730	67.3	5,230	31.4	7,423	39.1	-29.6
Wyoming 1	8,096	5,306	52.6	2,178	12.7	3,098	17.1	-29.7
Wyoming 2	10,559	5,690	85.6	1,663	9.1	1,769	15.3	-6.0
Wyoming 3	8,684	5,678	52.9	2,122	11.2	3,479	16.2	-39.0
Wyoming 4	8,721	5,563	56.8	2,781	10.3	4,302	15.7	-35.4

1/ About 90 percent of the minority races of the NGP coal region are American Indian.

Source: Census of Population, 1960 and 1970.

Appendix table 17-Types of families and children, by presence of parents for metro and nonmetro counties and Northern Great Plains coal region, 1970

Area	Family type		Children under 18 years	
	Husband-wife	Female headed	Living with only one parent	Living with neither parent
	Percent			
United States	86.0	10.8	17.3	3.9
Metropolitan	85.5	11.4	17.4	3.6
Nonmetropolitan	87.2	9.3	17.0	4.9
Northern Great Plains coal region, total	89.9	7.0	11.0	2.6
Minority	76.3	20.4	31.3	10.3
Montana 1	90.6	6.0	8.4	2.1
Montana 2	89.4	7.5	13.7	3.6
Montana 3	87.9	5.3	8.7	1.9
Montana 4	87.6	9.4	17.3	5.8
Montana 5	87.9	8.3	17.6	4.2
North Dakota 1	90.0	6.7	10.0	2.0
North Dakota 2	90.3	6.8	8.5	2.0
North Dakota 3	90.2	6.7	8.6	1.5
South Dakota 1	88.9	8.1	14.8	5.1
Wyoming 1	88.2	8.7	13.6	3.0
Wyoming 2	91.4	5.0	10.9	2.9
Wyoming 3	90.7	6.0	11.5	2.5
Wyoming 4	91.0	6.8	10.5	2.6

Source: Census of Population, 1970.

* U S GOVERNMENT PRINTING OFFICE : 1978 261-496/47

Appendix table 18-Number of housing units and status of plumbing, metro and nonmetro counties and Northern Great Plains coal region, 1960 and 1970

Area	Year-round housing units, 1960		Year-round housing units, 1970		Change in substandard housing units, 1960-70
	Total	Substandard 1/	Total	Substandard 1/	
	Number	Percent	Number	Percent	Percent change
United States	58,318,297	18.2	67,699,084	6.5	-58.6
Metropolitan	36,386,215	10.6	46,082,602	3.2	-61.7
Nonmetropolitan	21,940,142	30.8	21,616,482	13.4	-57.1
Northern Great Plains coal region, total	139,074	29.4	140,459	10.6	-63.6
Montana 1	2,315	32.1	2,027	10.3	-71.9
Montana 2	12,910	26.1	12,338	8.5	-68.9
Montana 3	2,028	32.9	1,723	14.6	-62.2
Montana 4	7,716	39.1	7,595	16.7	-57.9
Montana 5	5,515	22.8	5,270	8.0	-66.5
North Dakota 1	39,392	33.3	39,655	12.9	-61.0
North Dakota 2	22,762	27.6	25,022	9.7	-61.4
North Dakota 3	12,210	33.0	12,096	10.5	-68.4
South Dakota 1	5,796	44.6	5,271	21.0	-57.2
Wyoming 1	6,918	17.3	6,799	5.4	-69.4
Wyoming 2	4,098	23.4	6,095	6.9	-56.2
Wyoming 3	8,021	22.6	7,210	6.1	-75.7
Wyoming 4	9,393	19.4	9,356	6.4	-67.1

1/ Substandard housing is housing that lacks complete indoor plumbing.

Source: Census of Housing, 1970, General Housing Characteristics.